COAL AGE

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Endowing the Spirit of Christmas

TWO YEARS AGO, the inhabitants of a certain little mining town were so poor, that Christmas fairly cast its shadow before. The company, too, was about as poor as the men. The mine had run on half time, and less, till a goodly part of those dependent on its operations were almost on half rations. For months the calls for help had been all too numerous. There were some who even wished that Christmas might somehow be passed over, for there seemed little chance to observe it in the usual gladsome way.

But there was *a man* at that mine. Coming up from the ranks until he became superintendent, he knew intimately the means and needs of his people. More than that, he knew that the real Christmas spirit consists of thankfulness and giving. Some three weeks ahead, he called a meeting to frame plans for a Christmas celebration. The women, too, were invited to this meeting, for this man knew that a miner's wife is in most cases his full partner. The whole camp turned out, largely in wonder to see what the superintendent was trying to do.

FIRST OF ALL, he told them that they were going to have the usual Christmas tree for the children. He said the company was going to see that there was a package of candy and fruit for every child in camp, and he thought there was enough of the previous Christmas stock in the company's store to give every girl a doll of some kind. The boys might have to do without an extra gift, but for most of them that would simply be another way to act the man.

Then he sprang his real plan to perpetuate the spirit of Christmas in that camp. He said:

"But the poor and helpless in this camp must be remembered, not only just at Christmas, but as long as they are with us and as often as the need arises. To do this we will organize a Good Fellowship Club. We shall all be charter members. We will each give some amount every month, according to our means, to be used to help the needy. Any amount from ten cents per month and up can be pledged. The company will collect this for us and turn it over each month to our treasurer. A board of our members will pass upon the cases requiring our aid. Finally, I am authorized to start this fund with a donation of $50 from the company. This organization will exist as long as we care to give. Now how many will become members?"

THE RESPONSE was so unanimous that practically the whole population of that camp became members of the Good Fellowship Club. Christmas that year was more than any one had dared hope it could be. The club began operations immediately after its organization. Its first act was to send a ton of coal to a widow who took in boarders. No races or creeds were recognized. No man injured in that mine since Christmas, 1914, but was promptly helped by the Good Fellowship Club, if help was needed. Men in any kind of trouble have been given consideration and materially aided if possible.

As times grew better, the club members gave more liberally, and its activities extended even beyond the confines of the camp. In 1915 a similar club was formed in a neighboring camp. The original club has collected and paid out several thousand dollars, every dollar of which conveyed the spirit of Christmas to those in need. Thanks to it and better times, the 1916 Christmas will be a record breaker. In fact Christmas in that community has been *endowed* and is a perpetual thing. The spirit of Christmas is in evidence all the year 'round.

* * *

THE STERNNESS and grimness of mining work and mining duties cannot smother the spirit of thankfulness and giving that is the essence of Christmas. Certainly our superintendent friend who endowed Christmas in his town has set an example for other mining communities. The same spirit that made luminous the life of Tiny Tim is working eloquently in the operations of his Good Fellowship Club.

* * *

Can we do better than to endow the Spirit of Christmas?

Ideas and Suggestions

Safety Standardization

By Samuel Dean

We are all familiar with the advantages gained by standard methods of production in different industries, by the use of standard equipment, and by standard methods of accounting. Standardization and efficiency go hand in hand. Up to the present, however, little effort has been made to standardize safety methods underground. At mines where timbering at the working faces has been systematized in such a manner that serious accidents from falls of roof have been greatly reduced, the managements are continually brought face to face with the difficulty of quickly teaching the newcomer how to protect himself. Methods of timbering vary greatly, even at mines where roof conditions are similar. When the campaign for safety standardization in mines starts, as it doubtless will, the method of supporting the roof under the different conditions met with will probably be dealt with first. This work should not be left in the hands of lawyers, politicians, or others not acquainted with mining; it should be handled by capable mining men, and the movement should be nation-wide. A miner who has been working under draw-slate in Pennsylvania should find, when he goes West and works under draw-slate in Colorado, that the method he was taught in the East is similar to the one in use out West. If such a condition could be brought about quickly the accident rate would be further lowered, the question of meriting or demeriting different mines would be simplified, and the accident insurance rates would be reduced materially. There is scope for discussion and much room for improvement in connection with the methods now in use for protecting both machine-runners and loaders in machine-cut places. The monthly income of the machine-runner frequently exceeds that of the superintendent (and no one wishes to see it reduced), his commands are generally quickly obeyed, but he constantly takes risks which the miner working with the pick would not be permitted to take. In several states, particularly in the East and the South, the machine-runner is allowed to work in "vast spaces" without a stick of timber. When manufacturers of machines publish photographs for advertising purposes, they generally show such places. Few efforts have been made to introduce a simple and "safe" method of supporting the roof where turret machines are used. Methods of timbering partings and curves, and the clearance between the sides of main and subsidiary haulage roads should be standardized with the object of preventing accidents in connection with cars and haulage appliances; and these standards should be compulsory, from the Statue of Liberty to the Golden Gate. This would have the effect, also, of drawing the other different divergent courses of the industry nearer parallelism. Standard methods of ventilation, dust-explosion prevention, etc., etc., would follow. A deputy state inspector recently informed me that in his district he considers that 95 per cent. of the accidents are the result of the injured person's carelessness, ignorance or neglect. Such a condition makes it imperative that we also standardize the individual. I believe that the best way to do this is by means of the cinema. I have always considered that the governors of the Bureau of Mines

Why "Booze" and I Disagreed

By Sim C. Reynolds *

Because:

I have learned, though closely associated and on intimate terms with booze for years, I was always "double crossed" in the end. I can now see plainly that I always got the "worst of the deal."

In playing the game of sociability with drink, it is clear to me now that stay though I might, as thousands of my fellows have done, to the end of the game, I couldn't possibly win. "The cards were marked, the dice were loaded, and nothing was so sure as that I would go broke in the end."

Booze and I Disagreed, Because:

I suddenly realized that drink, too, was robbing those I love best on earth of what is rightly theirs—shoes, clothes, and a respectable standard of living—and robbing them of that sense of security in my ability to protect and provide for them.

Booze and I Disagreed, Because:

I learned that to be known as a "drinker" was the poorest boost and the best "knock" ever handed out to any man; the rottenest recommendation in the world, to any employer.

Booze and I Are Strangers Now, Because:

I have suddenly awakened to the fact that to be a drinker is to miss the best that life affords for me and mine—health, happiness, and the respect of my fellowmen—while drink means discontent, desolation and death. For your own sake, and for the sake of those you love, take a "fall" out of booze and win.

* Mine Inspector, Houston, Penn.

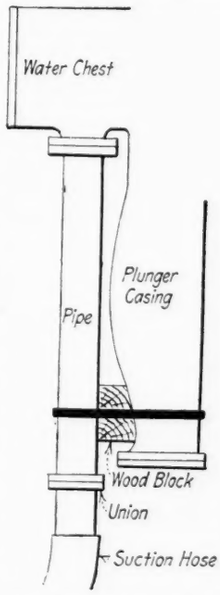
missed a great opportunity in not flooding the mining districts with films showing modern safety methods for employment in mining.

Coal Age is eminently qualified to start the campaign. At any rate I would like to hear the opinions of other mining men.

Steadying the Suction Pipe

By J. F. K. Brown*

The device illustrated herewith is for use on sinking pumps, and though it may be quite contrary to common practice, I have found it useful on a number of troublous occasions. It is given here for the benefit of others having the same trouble. In sinking it has always been my custom to use a length of pipe at the suction which will reach just below the bottom of the pump, and to attach the hose at this point with a union. This has been done because there is little room between the body of the pump and the pipe in which to place a union and to take off and put on the hose. It is easier doing it just below the pump. When this pipe was first used it caused trouble by frequently breaking off where it entered the pump, because of being knocked against the sides of the shaft in raising or lowering. To obviate this a piece of wood is now inserted as shown in the drawing. This has the effect of making this piece of pipe solid with the pump throughout its entire length. Breakage of this pipe is now rendered infrequent as the pipe is thoroughly steadied by the block and cannot vibrate.



THE STEADY BLOCK IN PLACE

Efficiency at the Top

By A. A. McDonald†

Nearly a hundred years ago, upon the Island of St. Helena, death closed the career of the world's greatest organizer, the leader and peer of all efficiency experts—Napoleon Bonaparte. Having conquered practically the whole world, he was unable to conquer himself and fell—a victim to his own egotism and greed.

The story of his fall is of interest for the reason that it carries a lesson to the coal industry. In our studies of efficiency we are all too prone to view everything from the driving end, forgetting the leading. Driving is the occupation of the muleteer; leading, that of the master mind.

One of Napoleon's greatest stepping stones to glory consisted in his ability to imbue the minds of his legions with the spirit of "One for all and all for France."

Corporations that exist in the abstract cannot hope for the greatest degree of efficiency. Men easily salve their conscience with the thought that their lack of diligence is only cheating something vague—somebody they will never know.

Boards of directors and general managers would be well advised if they would show themselves at their properties more often—frequent visits to their mines, not accompanied with the pomp of an Eastern potentate that only breeds enmity and discontent. They should endeavor to create as much as possible the man-to-man spirit.

Another great asset of our dead hero of long ago was that he played no favorites. His maxim and that of his armies was: "Every man carries a marshal's baton in his knapsack."

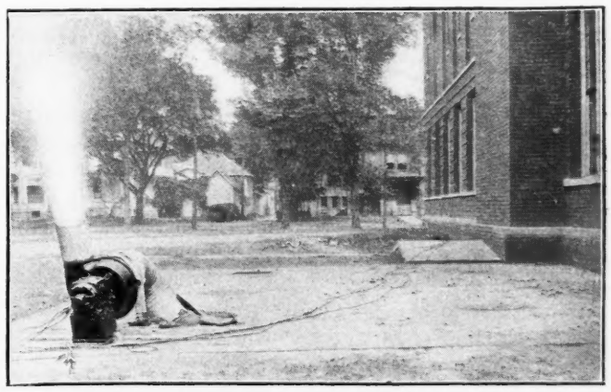
Organizations that find it necessary to carry on their payrolls "knights of the round table," or somebody's son, drawing big salaries and doing nothing, are in an unhealthy condition. If it cannot be helped, and the drones must be kept, then charge their cost up to some account other than the payroll and get them out of harm's way. Don't let them hang around; their example will reach down to the smallest trapper boy.

Last, but not least, Napoleon successfully hid the ill in his own private life, causing to prevail a reputation for absolute integrity and fairmindedness. The guiding hands of corporations will do well to scrutinize the activities of their legal representatives, particularly in their dealings with employees, lest their companies' reputation for integrity be jeopardized for doubtful gain. Above all, if organized demand secures for the majority a raise in wages, do not forget the unorganized minority. Deal squarely with them, and they will be the more likely to do the same by you.

Efficiency is the handmaiden of a successful mining operation, but she cannot be driven. To lead, mount high the white charger of moral and professional purity, and ride well in front.

Putting Out a Coal-Bunker Fire

Early last spring the soft coal in the bunkers of the public school at Charles City, Iowa, took fire by spontaneous combustion, says C. V. Hull in *Power*. A direct-connected electric fan was placed and connected as shown in the illustration, to draw out the smoke so that the men could shovel the coal over. The construction of the bunkers is such that the fan drew air over the shovelers and kept the space clear of smoke and also prevented it from entering the building. After several days of hard, dirty work the fire was reached and the smoldering coal taken out.



FAN USED TO DRAW SMOKE OUT OF COAL BUNKERS

*Sydney, N. S.
†Monongahela, Penn.

The Tonnage Available--I

By J. F. K. Brown*

SYNOPSIS—In most cases the marketable tonnage available from a coal deposit or a given area in a certain field may be predetermined with considerable accuracy. Certain deductions from the total quantity apparently present must, however, be made. Among these are absence of coal from erosion, natural unworkability, losses in extraction and losses in operation or preparation.

Coal mining differs from metal mining, in that the total quantity of the mineral to be mined can be estimated with reasonable certainty before operation commences. There are no "possible" or "probable" reserves in the generally accepted definition of these terms. Furthermore, the mineral being won is extracted as a whole, not being a percentage of that taken out, and subject to further processes of refinement before a salable product is obtained.

Calculation of the tonnage available, therefore, is the product of thickness and area, less allowance for loss in extraction, for erosion, etc. It is in the proper estimation of the necessary allowances that experience and knowledge is of extreme value.

Area, multiplied by thickness, in terms of square feet, and feet, produces cubic feet of coal, and the result multiplied in turn by the weight of the cubic foot gives pounds. But coal, like any other mineral, or ore, has a varying specific gravity resulting in difference in weight and, therefore, if for any reason great accuracy is required, the specific gravity of the fuel in that particular area will need to be determined.

In the majority of cases, and especially where large areas are in question, it serves a sufficiently accurate purpose to calculate the tonnage on a fixed basis. Where so much has to be allowed for, in loss and other ways, it seems an unnecessary refinement to determine afresh specific gravities, when average figures provide a short cut to the same result. A simple rule is: Tonnage, in tons of 2,240 lb., is the product of the thickness in inches × 125 × 640 × the number of square miles in the area. The figure 125 is a constant based on coal with a specific gravity of 1.25 and represents the amount of coal in tons in one acre 1 in. thick. Six hundred and forty is the number of acres to the square mile.

Tables are also in existence which cover the same ground. Where the seam exists in a dipping formation, allowance has to be made for an increased tonnage, since in the triangle formed by the surface of the ground, the vertical line from the surface downward, the boundary of the field, and the line representing the dip of the seam, the latter line is the longest. The total additional tonnage is in proper proportion to this additional length.

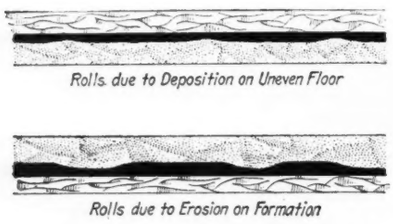
Allowances are made for the following: (1) Erosion and absence of coal, (2) natural unworkability, (3) extraction in working and (4) loss in operation.

The first deals with geological conditions, as likewise in some measure does the second; the third is mainly concerned with the methods of working and the last with the whole operation, including sales.

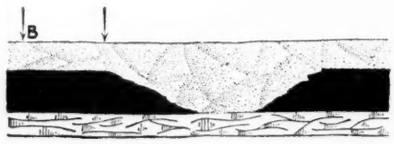
Allowances to be made under the first and second headings can be considered together. Coal areas in common with other strata are subject to certain geological phenomena—disturbances, upheavals, dislocations—the presence and intensity of which tend to lower the value of the field.

Erosion, or absence of workable coal, is mainly the result of "washouts" or intrusions of foreign matter. Washouts are phenomena that occur concurrently with the formation of the coal, whereby part of the seam was eroded, or carried away. Seldom are they extensive enough to completely destroy the field, but they can be a source of annoyance and expense in operation through flows of mud, sand and water, with which they are commonly accompanied. It is unusual to find more than one area washed out, or more than one old river bed, but such areas may be superimposed one above the other in each successive seam, or they may even miss one of the seams and appear both above and below.

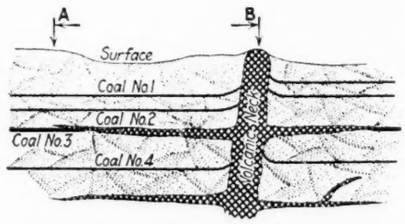
Ordinarily, except where outcrops are strongly developed, there is no surface sign of such erosion, and owing to the small proportion of the area affected to the total area being proved, there is small chance of their discovery, during subsequent boring. In a developed country, and where adjoining areas are being worked, the plans of such operations if available and correctly delineated will show the course of such troubles—whether leading directly into or likely to be projected outside the area under consideration. Geological survey plans, if on a sufficiently large scale, will also provide the same information. Beyond these two sources, which are only available in well-known mining fields, there is no means, except the test of actual operation, of knowing whether "washouts" are going to be serious objections to the contemplated mining.



ROLLS IN THE COAL BED DUE TO VARIOUS CAUSES



ROLL AFFECTING QUALITY: CHANGE BEGINS AT B



VOLCANIC INTRUSION ALTERING QUALITY TO A

*Sydney, N. S.

Damage from intrusive sources most frequently takes place through the projection of igneous sheets or dykes—that is, either horizontally or vertically intruded masses. Both are frequent causes of much damage, but of the two the horizontal intrusion is the more destructive.

An intrusion parallel to the stratification of the coal beds is always possibly harmful to two seams, those immediately above and below; and where the mass of injected material has been great, and the temperature high, complete destruction of a number of successive coal beds both upward and downward may be looked for. This is brought about by the baking of the strata surrounding these seams.

Evidence of such an extensive flow is usually present in abundance at the surface, in the alteration of the sandstones and shales comprising the section of visible strata, such indications being so strong as to be unmistakable. The less the destruction effected and the smaller the size of the intrusive sheet, the less the likelihood of detection through surface evidence.

One requires to remember however that such intrusions are not always destructive. There are well-known seams of coal, both underlain and overlain by intrusive sheets parallel to the seam, in which the only effect noticed has been an improvement in quality, brought about by long contact with the injected material. Everything in such cases depends upon the distance between the seam and the igneous sheet, and the temperature at which the mass forced its way into position. The alteration of the coal is mainly shown by a decrease in volatile matter, an increase in fixed carbon and a slight proportionate increase in ash.

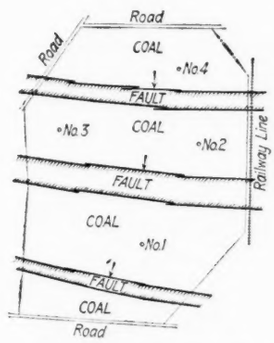
Where the intrusive mass has been injected at any angle to the coal strata, it forms a division, or wall, that passes through the complete section, touching all the coals contained therein; but its effect laterally is small. Consequently, while each seam will present the same features, the extent of the destruction depends upon the thickness of the intrusion, the temperature and the penetrability of the surrounding strata.

With this type of intrusion, there is always the additional possibility of the wall-like mass branching off into sills and ledges, which may run long distances in the measures close at hand. Certain conditions of rock formation lend themselves to this, such as the presence of thin coal bands or seams of shale which "burn" or volatilize readily. As generally found, sills formed in this manner have no great thickness, nor is their effect on the coals great, unless they occur near the seam.

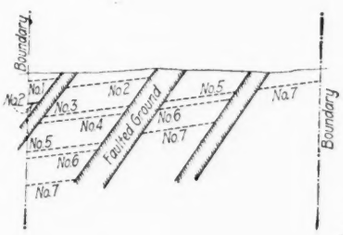
Usually, fairly satisfactory evidence of the pressure of a mass of material of this nature is visible on the surface in its outcrop. As such rocks are frequently harder than the coal measures that surround them, this results in a more or less well-defined ridge, whose direction, dip and area correspond to the position of the intrusive "dikes" below, and whose position and possible extent of damage caused thereby can probably be accurately estimated.

On the other hand, certain classes of igneous rock, where intruded in a vertical position through horizontal strata, have proved themselves easier to weather than the coal strata, which have been protected by their horizontal formation. This is especially the case where shales are weathered into clays and so form protective covers. Here the volcanic intrusion will show itself by a series of hollows following the line of its outcrop.

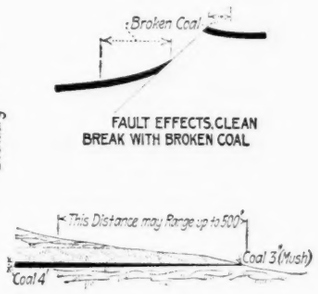
It is difficult to make any calculations of the tonnage of coal that will be lost in a field of this character. This depends much on the extent and the intensity of the volcanic intrusions. In some cases the coal has maintained its quality and its thickness right to the wall of the dike, while in others the coal has commenced to alter for the worse, 200 or 300 ft. away on either side. There have been still other instances where the occurrence of such intrusions has caused the property to be condemned, leaving it to later investigation to discover that the coal had, if anything, slightly improved.



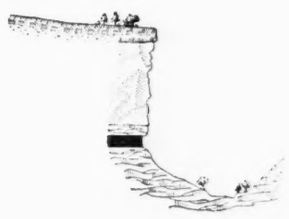
SMALL AREA CUT BY CROSS FAULTS



SECTION ACROSS FAULTED FIELD



SEVERE OUTCROP WEATHERING



EXAMPLE OF WELL-PRESERVED OUTCROP

For these reasons, considerable caution should be exercised in examining fields of this character. It is a safe and conservative measure to allow a loss of 300 ft. of coal on either side of a vertical or inclined mass, and if such masses are frequent, they should be outlined and plotted in order to ascertain if workable sections of coal occur between them.

Where the intrusions are horizontal, it is necessary to rely upon evidence furnished by boring, and hint of their existence is a strong reason for the use of drills in any such fields. From the drill records it is possible to find whether coals above or below the intrusion are altered, and calculations can accordingly be based thereon.

With intrusive masses that do not appear to follow any particular direction, the field is one of the most unreliable, since not only is coal destroyed, but the field is cut up into sections, perhaps so small that the cost of reaching each barely covers the profit from operation.

Where the materials or ingredients of such intrusions are magnetic, as in certain masses highly charged with magnetite, it has been suggested that the magnetometric

survey system might be used to outline these "bosses." Accordingly, as the value of coal areas increases in those countries where coal is always in demand and increasingly so, this suggestion might yet be tried where applicable, to outline and indicate the depth and thickness of such intrusions, and thus by inference determine the value of the field.

Faulting, another geological feature that causes loss of coal, may be either local or part of a general system affecting a large area of stratification. In the investigation of coal areas faulting may become responsible for complete disappearance of the coal bed, or otherwise adversely affect the working of the field, even to the extent of making it valueless. The presence of faults in any coal district may or may not be detected by inspection on the surface, but if they are to be detected by surface examination, it is only by close study of the geological conditions.

In well-proved fields and older countries, geological maps give valuable help, and the operations of surrounding mines will enable the information to be properly placed and read. With the newer lands, there is more pioneer work to be done by the first companies and consequently greater risk to be undertaken in this respect, since faulting is always a trouble that in these conditions may not well be detected by any other means than that of operation. In the mind of the geological student faults are considered to be lines of break extending upward or downward, whose existence frequently means the loss of a considerable area. There may be no coal for a distance of 200 or 300 ft. in width running along in a strip parallel to the run of the fault, and where the areas are being dealt with in acres this may represent a considerable reduction in available coal.

Of the other geological disturbances that cannot be detected from surface inspection, rolls in the coal are probably the most likely to affect a whole field to its detriment. They can be formed either through movement of the strata after deposition and hardening or through erosion at a time coincident with the deposition of the coal. Those produced through after movement are not detrimental to the field, since in them the thickness and the character of the roof and the floor remain the same. The greatest underground trouble their presence produces is water, but that may quite readily be due to other causes and remedied by other underground and after-created conditions such as dip.

It can be considered that such rolls are preliminary to faulting, which more commonly results as the movement goes on. Rolls produced during the period of formation are the source of much greater loss, resulting in a condition of variable thickness sometimes accompanied by decrease in quality. They may be the result of deposition on an uneven floor, or from erosion after formation.

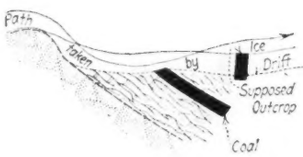
Deposition upon an uneven floor affects the thickness of the coal, but erosion tends to affect both the thickness and the quality, through the introduction of a sandy mixture in the carbonaceous material destined to be a coal bed. In fields that are susceptible to such influences the change in quality is as sudden as it is exasperating, and at first takes place without being detected from inspection of the fuel.

The discovery and examination of the outcrop of a coal bed is about the most dependable source of information that can be looked for in any coal area. A clear outcrop—reliable in quality and thickness—is only available where the strata immediately overhead are not only impervious to water, but are also capable of great resistance to weathering. Where the weathering qualities of the roof are poor, the actual seam is usually hidden under material broken from the face of the exposure and covered through time with vegetation.

Should the strata above be porous in addition, the thickness of the coal may be so reduced as to show the supposed workable bed as a few inches of soft mushy coal when finally located at the crop, and the correct thickness of the deposit may not be ascertained until after a considerable amount of cover has been attained.

The quality of coal at outcrops, as may readily be expected, deteriorates by weathering and, consequently, samples taken at this point cannot be considered as proper guides to quality where unaltered and unweathered. There is, however, no greater mistake than listening to the all too-common doctrine of the vendor of a property and many others who ought to know better, "that the quality will and always does improve with depth."

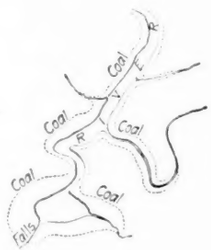
Such a statement as this appears even in the published accounts of many new coal fields, by ill-informed authorities, all unconscious that by using this language they are condemning the field they intended to praise. One of the most important factors in the success of any coal mine is the continual maintenance of one standard of quality. Consequently, a mine which begins to operate with a seam near the borderland of commercial success, and expects to make its profits on a mythical increase in quality, is tempting fate. A coal once away from the purely local effect of weathering is just as likely to show a decrease in quality as an increase. It would indeed be an astonishing provision of Providence were all the outcrops of coal beds considerately situated at the worst portion of the field, always leaving room for improvement as the work advanced. This is too astonishing to contemplate. There are few minerals that are so



FALSE OUTCROP DUE TO GLACIAL ACTION

OUTCROP WEATHERED TO WATER LEVEL

TWO INCLINED-SEAM OUTCROPS



OUTCROP OF A HORIZONTAL BED

A SIMPLE BORING PROBLEM

consistent in thickness over large areas as coal beds, and to assume that the thickness and the quality is going to change to produce a marked increase in value in a relatively short distance is also to admit the same likelihood of a decrease in thickness and quality. Increase or decrease in thickness either locally, as in rolls, or over long distances, impart to the measure all the characteristics of a lenticular deposit, and in such beds an increase in thickness at any one point inevitably leads to a decrease at the corresponding position on the other edge. The actual thickness, where exposed, is a matter of chance, depending on the horizon to which erosion was carried in days gone by. It may be either on the thinning edge or on the thickening edge of the deposit.

Problems of Outcrop Location

The easy or difficult location of the outcrop of the coal seams varies as the topography of the surface of the land. Those countries wherein glacial drift or surface soil is heavy, preserve the coal indications under so heavy a cover as to make the finding of the actual outcrops a matter of considerable difficulty. Rough and hilly lands, where the coal bed stands at an elevation above the main floor of the country, present the best features in outcrops, since the seam being above the drainage level the surface clay and soil is washed off and the traces of the coal itself more easily found and located.

This is much emphasized in the case of horizontal coals. Again, where sloping seams exist, the outcrop is fairly easy to trace and follow and its direction is easier to determine. The nearer the approach to the vertical, the nearer does the outcrop come to being a straight line. The examination of the outcrop has the further advantage in many cases of permitting an examination in detail of the roof and pavement rock; the conditions in which these exist being just about as important as the quality of the coal. An underlying clay that soaks in moisture is apt to be a possible source of creep and crush, and much water in the seam itself indicates a wet working. Springs of water may appear above the coal, and still the bed itself be dry, this being due to protective shale measures above.

Importance of Roof Conditions

In the same way a clay roof parting helps toward dry operation; a shale above the coal usually means an uncertain roof; a blocky sandstone possibly a roof with heavy breaks; sandstone with much false bedding will probably produce a treacherous covering, requiring great care, and resulting in heavy timber cost. A heavy shale is often a good roof, and a shale overlain by a sandstone within a reasonable distance will perhaps be a very dependable roof under certain conditions of working. Where there exists in any type of roof a good parting, such as thin coal, some distance above the working seam, such a roof will yield heavy pressure, owing to the line of easy parting provided by the overlying coal.

There are modifications of all these conditions without number, but one point is worth bearing in mind; and that is, that methods of working have considerable influence on the behavior of any roof, and it is quite within the limits of reasonable supposition to consider that a roof which appears to be a first-class workable proposition from inspection may upon operation prove entirely the reverse.

Recollections of a Manager

Coal-mining officials living at mining camps find plenty of opportunities to contribute out of their earnings toward the relief of the needy and unfortunate. Such calls often come in quick succession, but they are always met promptly and joyously.

In contrast, officials living at a distance from the actual operations have no similar opportunities, since they are never in close touch with the kind of men who live, at best, from hand to mouth, and who, in consequence, are quickly undone at the first change of fortune. I had been manager for several years before I realized that my expenditures for charitable purposes had practically ceased after accepting the manager's chair. In making a summary of my expenditures, I was suddenly brought face to face with the fact that I had not made a single contribution during the year for the relief of a human being.

The discovery was not exactly pleasing, since I had always had supreme contempt for men who were so wrapped up in their own efforts as to be deaf and blind to the needs of their more unfortunate brothers. It had never occurred to me before that chance alone was responsible for most of my philanthropy.

At the next meeting of our board of directors the question arose as to the advisability of granting all our men a 10 per cent. increase in wages, and the board voted to leave matters in my hands. I surprised them by promptly suggesting that I was not competent to decide the matter alone, but felt that it should be referred to our district superintendents for final decision. While the discussion had been taking its course, I had recalled my discovery in reference to my contributions to charity, and it occurred to me that since I was so completely out of touch with the men who were to be most vitally affected by the increase, I was not the one to judge of its necessity.

When I gave the board my reasons for the suggestions that I had made, a lively discussion was set agoing. It started out with charity, then ran into unionism and up into socialism, and wound up with the so-called "current unrest," and the I. W. W. that it is breeding. At the first mention of I. W. W. every one present became very grave, and one of the directors who only a moment before had ridiculed the necessity of the proposed increase in wages suggested that possibly we were coming to a conclusion too quickly, and expressed a willingness to give the matter fullest consideration. My recommendations in the matter were finally adopted, and I was instructed to report back to the board as promptly as possible.

The next matter brought up for discussion at that meeting was the advisability of contributing a car of coal to the United Charities of the city. One of the directors remarked that in previous years we had generally been asked to contribute two cars, but had never given even one. "Suppose we surprise them this year," he said, "and give them three." His suggestion was received with the greatest enthusiasm, and shipping instructions for the three cars were given immediately.

That reminded me that an appropriation for the community Christmas at our mines had not yet been approved, and the time for discussing the subject seemed opportune, since every one present was now in a pleasant mood. I laid the matter before the board with my recommendations. They promptly voted me power to carry out my suggestions and then surprised me by making personal contributions to the fund that more than doubled it.

Modern Practice in Fuel Briquetting

By W. P. Frey*

SYNOPSIS—Success in commercial briquetting has long been retarded for want of a suitable binder. The use of a petroleum residuum for this purpose, and the careful arrangement and adjustment of machines and processes, has secured a successful commercial product at the plant described.

The problem of briquetting coal, especially anthracite, involving as it does the utilization of enormous quantities of fine material now wasted, has been the subject of long years of laboratory investigation and practical experiment. Owing chiefly to the difficulty in finding a cheap, but efficient and nonobjectionable binder, commercial success has been attained but recently. Within the past few years, however, vast strides have been made in both the technical and practical sides of the problem, and today the commercial briquette is actually on the market, forming a potent addition to the fuel supply.

In general the difficulties in briquetting concern the application and treatment of the binder selected and its relation to the material to be briquetted. The range of available briquetting material is wide. Briquettes have been made from peat. The vast lignite deposits in the West should eventually lend themselves to the process. Bituminous coal briquettes are now being manufactured at several plants. Coke "breeze" is another material of interest. Each brings its own treatment problem, which can be solved only by serious study and experiment.

As for the binder, it may be safely stated, after years of investigation with tar, pitch, "sulphite pitch" (waste liquor from paper mills) and a host of patented formulas and combinations ranging from complex organic products to simple cement, that the most practical binder for all classes of fuel briquettes, from the standpoint of economy consistent with efficiency, is the heavy residue of petroleum (melting point about 160 deg. Fahr.) known as hydrolene, used in connection with the Dutch oil process. This is controlled by the General Briquetting Co., of New York.

It is not the purpose of this article to discuss in detail the various experiments leading to the present method of operation of the plant under consideration, but rather to briefly describe that method itself.

The plant in question is owned and operated by the Lehigh Coal and Navigation Co. at Lansford, Penn. The original plant was completed in 1909 and went into operation at once, the product being manufactured with a tar pitch binder. It was rebuilt in 1911, and operated until the spring of 1915, using the same material. In the latter part of 1915 the process involving the use of the hydrolene oil installed by the Malcolmson Briquet Engineering Co. and the General Briquetting Co. was introduced. Subsequent operation has been based on this process.

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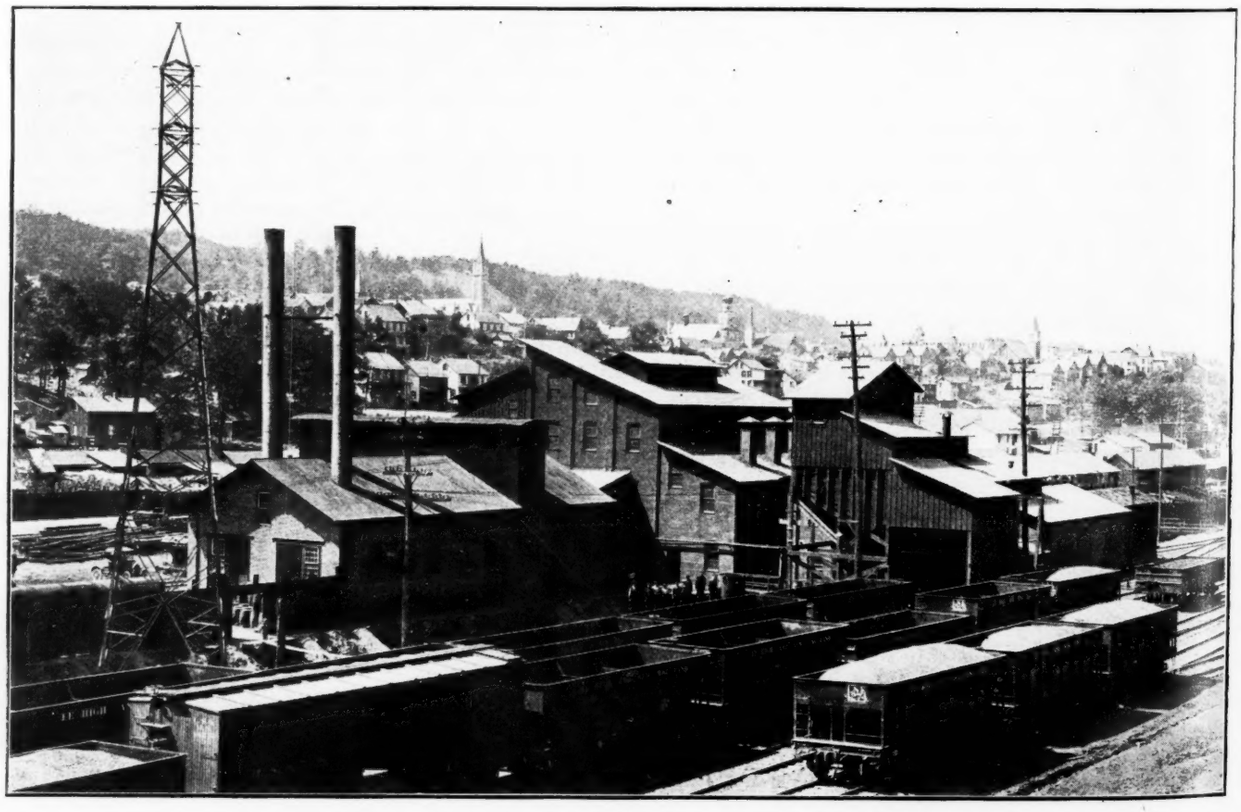


FIG. 1. GENERAL VIEW OF THE BRIQUETTE PLANT AT LANSFORD, PENN.

The entire operation naturally divides itself into four (4) departments, each a distinct operation:

1—The preparation of the raw fine fuel: (a) Drying, (b) screening, (c) cleaning.

2—The preliminary handling of the oil binder.

3—The mixing and intercompounding of the coal, dust and oil: (a) Paddle mixer, preliminary mixing; (b) edge runner, combination grinding and intercompounding.

4—The pressing of the coal and oil flux into briquettes: (a) Final fluxing, (b) feeding, (c) pressing, (d) final cleaning, (e) loading.

The fine coal, or silt, is first cleaned at the breaker by a combination of jigging and washing. It is then dispatched to the briquetting plant in cars. The wet silt is dumped into a track hopper and conveyed to the dryer drums. These dryers are of the rotary single-shell type, made by the Vulcan Iron Works, of Wilkes-Barre, Penn. The fuel is No. 3 buckwheat coal, or an approximate equivalent. The temperature at the end of the drum varies from 350 to 500 deg. Fahr., according to conditions. The fuel consumption varies according to the size and moisture of raw material from 5 to 20 tons per 100 tons dried.

From the dryer the fine coal is conveyed to the screens and sized in preparation for the final cleaning process. The material contains 1 to 2 per cent. of moisture—the maximum allowable for this stage of the process. The screens divide the fuel into four different sizes, to which the air separators are adjusted.

The ensuing cleaning, or separation, is performed by a set of four Damon air separators. It is possible to reduce the impurities by 10 per cent. with this equipment, but the best practice, from the point of view of economy, is to extract about 6 per cent. There are times when even with an extraction as low as 6 per cent., 45 per cent. combustible matter is left in the waste. When the adjustment is made for a 10 per cent. extraction, 65 per cent. of good coal may be carried into the waste. This is too much from the standpoint of efficiency.

For reasons of economy, and because of the dust nuisance, it is now the tendency to eliminate the dry-air separation and to depend entirely upon the wet process for cleaning employed at the breaker. Although the dry-air process is still in use, a bypass has been installed whereby the operation of the whole separator plant may be omitted. However, too much stress cannot be laid upon the importance of the preparation of raw material. Many failures in briquetting can be traced to lack of attention to this detail. At the plant of the Lehigh Coal and Navigation Co. so much importance is attached to the silt preparation that every car of raw material, and of finished briquettes, is subjected to careful sampling and chemical analysis. The briquettes are not supposed to run above 16 per cent. in ash.

The hydrolene oil (Sun Co., of Philadelphia) is a black material which melts between 160 and 170 deg. Fahr. This is delivered in tank cars of about 30 tons capacity. As the material is solid at ordinary temperatures, the first process, after the car is received in the shed, is the heating of the oil in the car, by means of steam.

When the oil has been liquefied, it is delivered through the steam-jacketed pipe seen in Fig. 4. A Kinney rotating plunger pump, type SD, is located in this line. This has worked with entirely satisfactory results. By alternating at will the valves *B* and *C* in the pipe line, the oil can be drawn either from the car pipe or the 12,000-gal. storage tank *H*. The oil, just before passing through the pump, encounters a steam-jacketed strainer which eliminates any possible foreign matter. From here the oil passes up the steam-jacketed pipe line *D* to the feeder tank *E*.

As the oil used is a mixture of complex hydrocarbons of varying viscosity, there is a constant tendency toward the separation of a portion of the oil and consequent clogging. Constant agitation is the best preventive of this evil. It is therefore advisable to keep the feeder tank *E* practically full at all times. To take care of the overflow, a pipe line is run to the storage tank *H*. The storage tank has a capacity of 12,000 gal., which is ample to take care of any surplus. From the feeder tank *E*, the pipe line *F* takes the oil to the paddle mixer, which forms the beginning of the next step in the process.

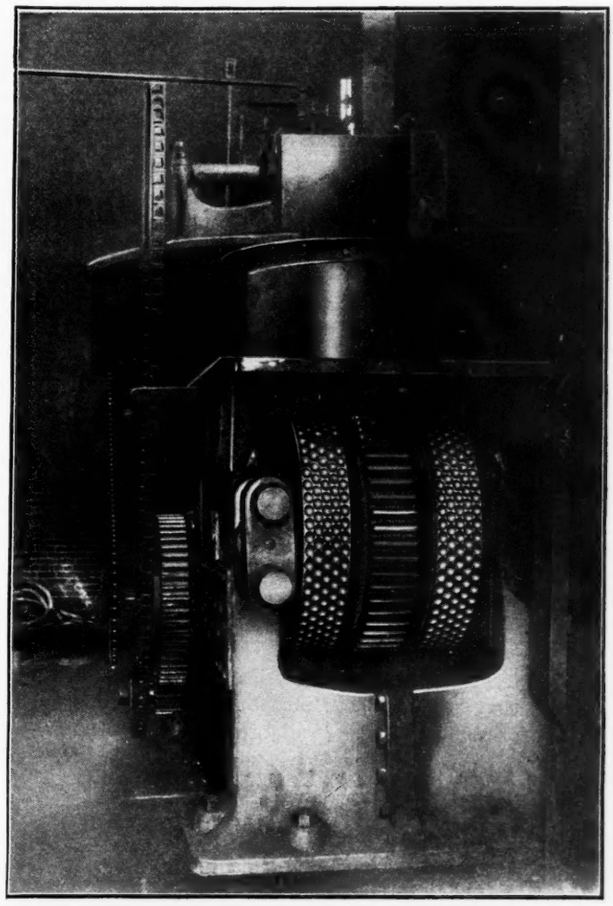


FIG. 2. BELGIAN BRIQUETTE PRESS

This third step in the briquetting is really the most delicate stage of the whole process. Upon the proper proportioning and compounding of the two elements involved final success depends. And in this proportioning and compounding are involved many delicate adjustments, each installation having features peculiar to itself. It may therefore be said that no definite hard-and-fast rules can be laid down. It is necessary, in all new layouts, to study and experiment with the arrangement of each stage of the process, before the proper and ideal method can be reached.

The apparatus in which the coal and oil meet is known as the "paddle mixer." In the Lansford plant it is a

horizontal steel trough about 35 ft. long and 21 in. wide. A 3½-in. square shaft revolves in the center, carrying 56 cast-iron paddles, set at uniformly varying angles and pitched to give a forward movement to the coal-oil mixture, which we will hereafter designate as flux. The coal is delivered at one end from the dryer by means of a belt, and the oil at 250 deg. Fahr. is carried in by a pipe from the feeder tank, as previously mentioned. The

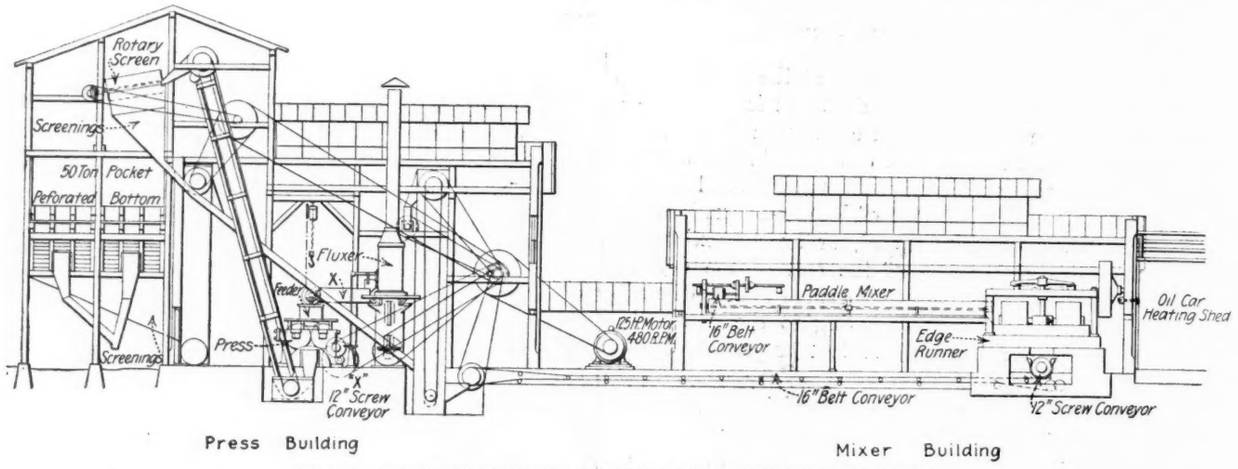


FIG. 3. CROSS-SECTIONS OF PRESS AND MIXER BUILDINGS

mixture is kept hot, and the consistency of the mass is improved by the injection of live steam at intervals. The point of mixture of the oil and the dust requires close supervision, and a man is in constant attendance.

The hot flux, thus mixed with a fair degree of thoroughness by the paddle mixer, with a small addition of moisture due to steam injection, is dropped into the edge runner. This machine is in effect a Chilean mill with huge heavy rollers, between which are specially constructed scrapers peculiarly adapted to their purpose. The edge runner at Lansford weighs 95,000 lb. The rollers each weigh 25,000 lb. Here, for a period, the plastic flux is thoroughly ground and stirred. The effect is a complete intermingling of the coal and the oil, which increases to a marked degree the cohesion of the final product and makes the breakage loss in the briquettes far less than that of anthracite coal. It is desirable that the edge runner be operated so wet that a little excess water is pressed out of the flux. After the edge runner treatment, the flux passes into a small breaking-up device which reduces any caking that may have resulted from the heavy pressure employed. From here the flux is transferred by a conveyor to the pressroom.

Stress should be laid upon the fact that ease of operation throughout the stages of mixing depends entirely upon care in adjustment and proportion throughout. For instance, too much oil results in "sticking" in the paddle mixer and the edge runner, while too meager an oil addition results in a fragile briquette. Set rules are not possible, as the problem is an individual one, but a few trials soon determine the course to pursue. The oil percentage at Lansford is 5 to 6 per cent. of the briquette.

The flux, arriving at the pressroom, is discharged from the belt conveyor into a pocket elevator, from which it goes to an additional auxiliary fluxer—a preliminary treatment to passing through the briquetting press. This fluxer—in effect a vertical paddle mixer—is of the utmost importance. Here the material gets a final effective intermixing. Here, too, screenings from the press and bins are returned for retreatment.

Aside from this, this fluxer is important as an aid in properly feeding the press.

The press crew, who control this fluxer, keep it well filled at all times, so as to maintain an unvarying supply of flux for the press. Furthermore, this machine, by the use of superheated steam, enables the operator to feed his flux to the press at about 135 to 145 deg. Fahr., the proper temperature for the Belgian press in use at Lansford. Also, at this point, a final addition of moisture can be made, by steam injection, if the flux is too dry.

From here a screw conveyor carries the material to the press feed device. This feeding apparatus consists of a pair of arms revolving horizontally, whereby a constant flow from the conveyor into the press is maintained. Proper feeding apparatus, to insure constancy of delivery, is of prime importance, and is one of the points too often neglected.

The flux now passes to the press. This machine is of the Belgian type—being in effect a modification of the well-known spring rolls. The flux passes between the two

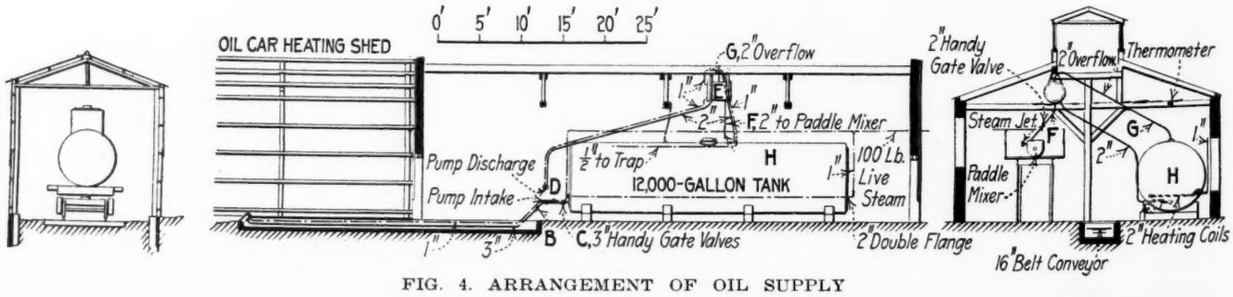


FIG. 4. ARRANGEMENT OF OIL SUPPLY

rolls, which are provided at present with steel tires. It is proposed to replace these with chilled cast iron. The egg-like shape of the briquette is secured by machining out the necessary semishape in the roll tire, the molds being placed so as to secure the maximum number for the dimensions given. Especial care is taken that the opposite molds shall meet accurately during the rotation of the press. The rolls are 39 in. in diameter and 3 ft. wide. The clearance, when running free, is infinitesimal, but the flux forces a slightly wider margin. The pressure secured varies from 3,500 to 5,000 lb. per sq.in. The peripheral speed is between 55 and 60 ft. per min. The presses here used were manufactured by the Vulcan Iron Works, of Wilkes-Barre, Penn.

From between the rolls the hot briquettes fall down a chute below the press and are picked up by a conveyor leading to the bins. A considerable portion of the flux now appears on the briquettes as joints or "fins"; consequently, a final rounding or shaping is necessary. The conveyor discharges the product into a revolving screen over the bin. The agitation received in the screen removes the waste and incidentally gives some opportunity for cooling. The briquettes drop into the bin, where they fall on a stationary screen, thence they are passed over a grizzly and into the railroad cars. The waste from the rotary screen, the stationary screen and the grizzly is conveyed back to the auxiliary fluxer, to repeat the process from that point.

The briquette thus manufactured is now recognized as satisfactory for domestic purposes. The short-lived light smoke occasioned by the presence of oil is but slightly odorous and not an annoyance. On the other hand, the handling loss is extremely small, the heat content is higher than in anthracite and the burning quality excellent. The absence of clinker formation during combustion is noticeable. The cost of manufacture is well below the acceptable market price. In short, it seems that a crying problem of national conservation is in a fair way toward commercial solution.

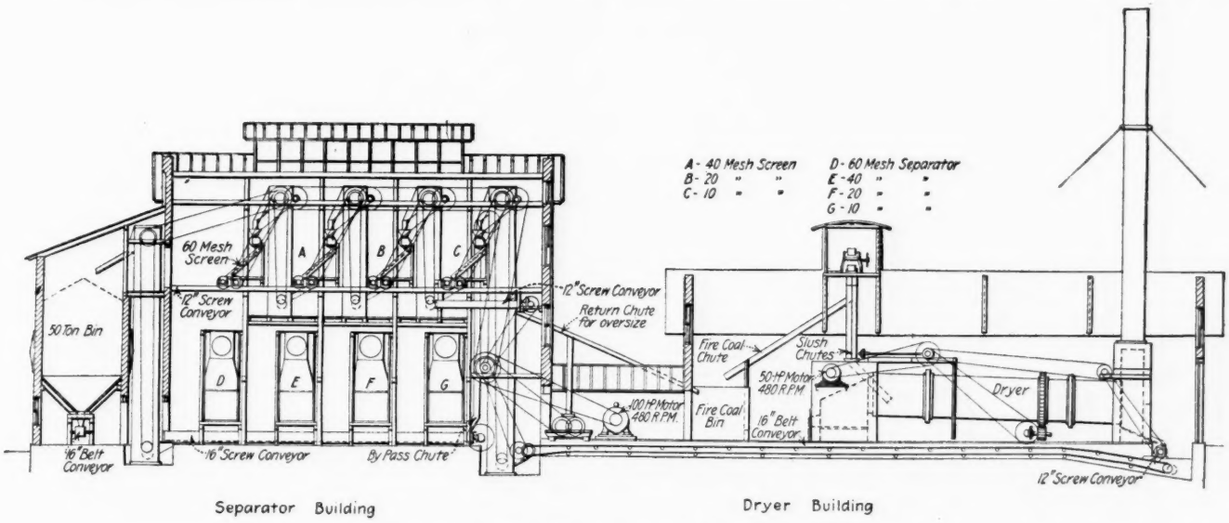


FIG. 5. SEPARATOR AND DRYER BUILDINGS

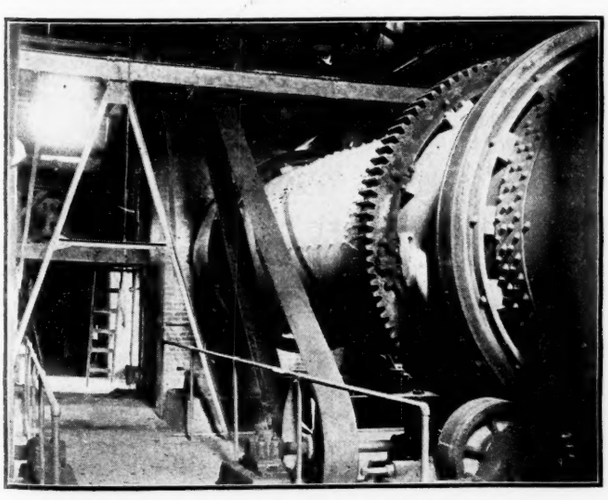


FIG. 6. THE ROTARY DRYER

Illinois Coal Output Increases

The coal production for the State of Illinois showed a gain of 6,071,836 tons, or more than 10 per cent., during the fiscal year of 1916 over 1915. For the year ending June 30, 1915, the total production was 57,601,694 tons; for the year ending June 30, 1916, 63,673,530 tons. The largest increase, actually and upon a percentage basis, is in the fuel sold to railroads, the gain in that direction totaling 3,357,120 tons, or over 30 per cent., while the increase in commercial shipments was only 2,693,201 tons, or slightly more than 6 per cent.

An advance summary of the figures here follows:

	—Year Ending June 30— 1916	1915
Counties producing coal	51	52
Shipping mines	284	280
Local mines	519	499
New or reopened mines	137	122
Mines closed or abandoned	111	139
Total employees	75,919	75,607
Total tons produced	63,673,530	57,601,694
Days active, all mines	163	158
Kegs of powder	1,150,504	1,107,326
Tons shipped	44,154,419	41,461,218
To locomotives	676,220	615,899
To railroads	14,447,497	11,090,377
To local trade	2,244,026	2,184,853
Consumed at mines	2,151,368	2,249,347
Fatal accidents	165	180
Nonfatal accidents	1,304	1,013
Employees to each fatality	460	420
Employees to each nonfatality	58	75
Tons per fatal accident	385,900	320,009
Tons per nonfatal accident	48,792	56,862
Fatal accidents per 1,000 men	2.2	2.38

The Coal Creek Collieries, British Columbia

By Thomas Graham*

SYNOPSIS—A brief description of the operations in the Coal Creek region conducted by the Crow's Nest Pass Coal Co. with particular reference to the analyses of the mine air made by the Canadian Government.

The Coal Creek colliery is opened on Coal Creek where the coal seams in their eastward pitch reach the level of the creek, the strike of the seams being approximately at right angles to the valley. The openings consist of drifts in the seams, starting on each side of the valley. Three seams are being worked at this colliery; namely, No. 1, No. 2, and the "B" seams. No. 1 is a large seam varying in thickness from 14 to 30 ft.; only 10 ft. of this seam, however, is being extracted. No. 2 seam is 4½ to 5 ft. thick, while the "B" seam is 10 ft. thick, the upper 5 ft. only being worked. The coals are bituminous in character and make an excellent coke, without washing, in ovens of the beehive type. About 40 per cent. of the output of the colliery goes to the ovens.

No. 1 East Mine

This mine, shown in Fig. 1, has three splits and is producing 1,500 tons of coal per day of two working shifts of 8 hr. each. The samples given in Table 1 consist of one from each air split and the main return, taken when the mine was idle, and a similar set taken when the mine was working. Unfortunately three out of these eight samples were lost in transit and had to be retaken at a later date when conditions were not quite similar so far as the volume of air in circulation is concerned. The amount of methane, per ton of coal mined, as shown opposite samples Nos. 25, 27, 49 and 50, is based, however, on the average tonnage produced when the mine was working.

Sample No. 48, taken in the main return, shows this mine as giving off 4,184,640 cu.ft. of methane per day. The average volume of gas given off, per ton of coal mined, based on the eight samples in Table 1, is 1,556 cu.ft., while the average based on the two main-return samples is 2,291 cu.ft. per ton of coal mined.

The workings of this mine, it is interesting to observe, are those overlying that area of No. 2 mine where the "bumps" are most severe, and which necessitated the abandonment of the area in question.

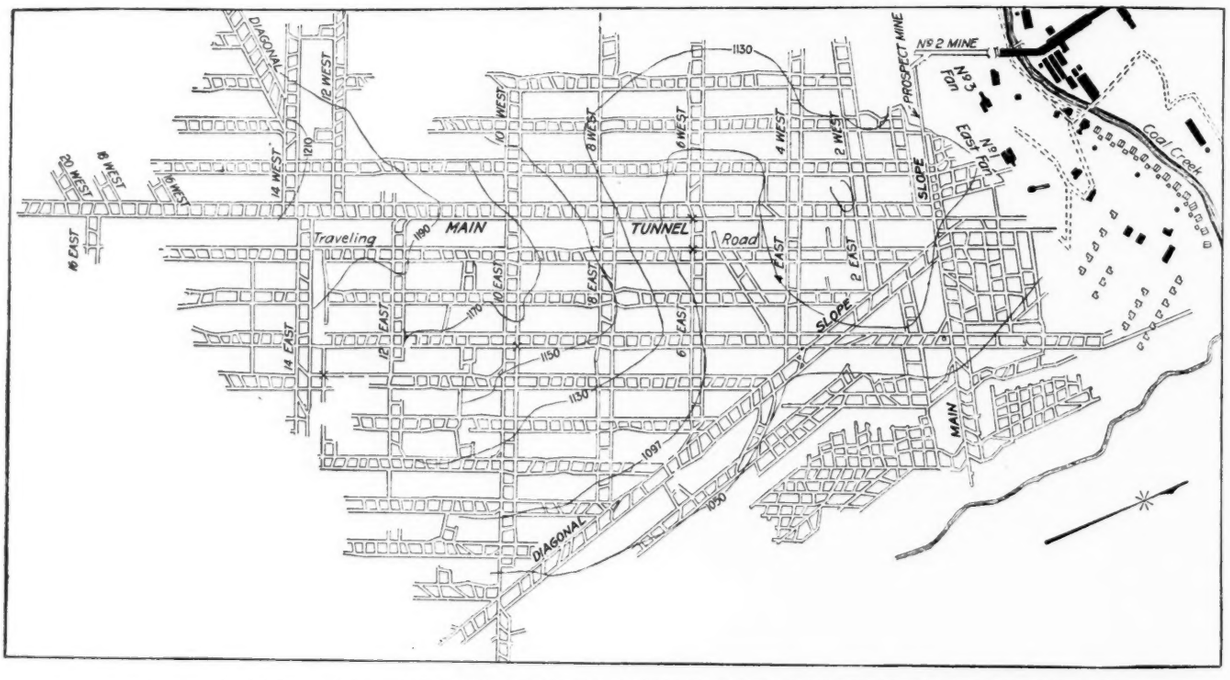


FIG. 1. PLAN OF NO. 1 EAST MINE, COAL CREEK COLLIERY, CROW'S NEST PASS COAL CO.

TABLE 1. NO. 1 EAST MINE

Sample No.	Date	Where Taken on Return	Average Daily Production in Tons	No. of Men in Mine per 24 Hr.	Volume of Air in Circulation (Cu.Ft. per Min.)	Per Cent. of Methane in Air	Volume of Methane Cu.Ft. per Minute	Volume of Methane Cu.Ft. per Ton of Coal Mined
25*	Feb. 23, '16	East-Side of Tunnel	.....	.....	15,460	1.87	288	1,036
49*†	Apr. 14, '16	Diagonal Split	.....	.....	33,000	1.67	551	1,983
50*†	Apr. 14, '16	West-Side of Tunnel	.....	.....	21,000	2.04	428	880
27*	Feb. 23, '16	Main Return	.....	.....	152,000	1.23	1,869	1,794
40	Feb. 24, '16	East-Side of Tunnel	400	...	12,000	2.73	327	1,177
39	Feb. 24, '16	Diagonal Split	400	...	30,800	1.49	459	1,652
41	Feb. 24, '16	West-Side of Tunnel	700	...	20,000	2.97	594	1,222
48†	Apr. 14, '16	Main Return	1,500	330	168,000	1.73	2,906	2,789

*Samples taken when mine was idle.
†Samples taken to replace samples lost en route to laboratory from series of Feb. 23 and 24, 1916.

*Chief Inspector of Mines for the Province of British Columbia, Victoria, B. C. Proceedings Mine Inspectors' Institute, Joplin meeting, June 13-15, 1916.

The coals are friable and little of any explosives are used in mining the coal. The seams are gaseous and safety lamps only are used.

No. 3 Mine

This mine (Fig. 2) is opening out the coal lying beyond the restricted area just mentioned, in No. 2 mine, and working the same seam as that mine. No. 3 mine has three ventilating splits and produces 250 tons per day, in two shifts of 8 hr. each. Samples 17 and 22 were taken in the main return. Samples 28, 29, 30 and 31 were all taken from each split and the main return on the same day and when the mine was idle. Samples 34, 35 and 36 were taken from the same splits on the following day when the mine was working. Sample No. 47 was taken in the main return on a working day nearly two months later, to replace a sample lost in transit from the series taken Feb. 24, 1916. The volume of gas given off, per ton of coal mined, based on the 10 samples of Table 2, averages 3,740 cu.ft.

Tables 1, 2 and 3 show the conditions attending the taking of mine-air samples from the mines now being operated at this colliery. Table 3 gives the results of samples of mine air from Seams Nos. 1 North, 1 South, 2 and B, in the Coal Creek colliery. It will be noted from the samples shown that No. 1 North and No. 1 South are less gaseous than the other seams. This is chiefly due to the fact that they have much less cover than the other seams and are being worked toward the outcrop. The volume of gas, per ton of coal mined, based on the entire set of 30 samples taken from this colliery is 2,030 cu.ft., as shown in Tables 2 and 3.

The time that elapsed between the working and idle periods in the mine was so short that little real value can be placed on the variation in the volume given off; but no opportunity was afforded for obtaining samples after a protracted suspension of work and advantage had to be taken of a single idle day or a Sunday. Feeders and blowers of gas from the roof and floor of the seams are more frequent in the Michel colliery than they are in the Coal Creek colliery; and, while it is true that following a period of "bumps" considerable gas is released from the floor in No. 2 mine, I am of the opinion that most of such gas was inherent in the coal seam.

TABLE 3. COAL CREEK COLLIERY

Sample No.	Date	Where Taken on Return	Average Daily Production in Tons	No. of Men in Mine per 24 Hr.	Volume of Air in Circulation (Cu.Ft. per Min.)	Per Cent. of Methane in Air	Volume of Methane: Cu.Ft. per Minute	Volume of Methane: Cu.Ft. per Ton of Coal Mined
No. 1 South Seam								
20	Nov. 23, '15	Main Return	400	102	24,000	1.85	444	1,598
43*	Feb. 25, '16	Main Return	...	..	19,250	1.14	218	784
46	Feb. 28, '16	Main Return	400	102	21,000	1.28	268	964
No. 1 North Seam								
19	Nov. 19, '15	Main Return	150	55	10,500	0.45	47	451
23	Feb. 22, '16	Main Return	170	55	8,400	0.33	27	228
44*	Feb. 28, '16	Main Return	...	..	7,500	0.27	20	169
No. 2 Seam								
15	Oct. 21, '15	Main Return	250	86	20,000	0.87	174	1,002
32*	Feb. 23, '16	Main Return	...	..	15,700	1.42	223	1,070
33	Feb. 24, '16	Main Return	300	86	18,000	1.39	250	1,200
"B" Seam								
21	Nov. 23, '15	Main Return	300	84	18,000	1.38	248	1,190
38	Feb. 24, '16	Main Return	300	84	19,500	1.09	212	1,017
51*†	Apr. 16, '16	Main Return	...	..	35,100	0.78	273	1,310

*Samples taken when mine was idle.
†Sample taken to replace sample lost en route to laboratory from series of February 28, 1916.

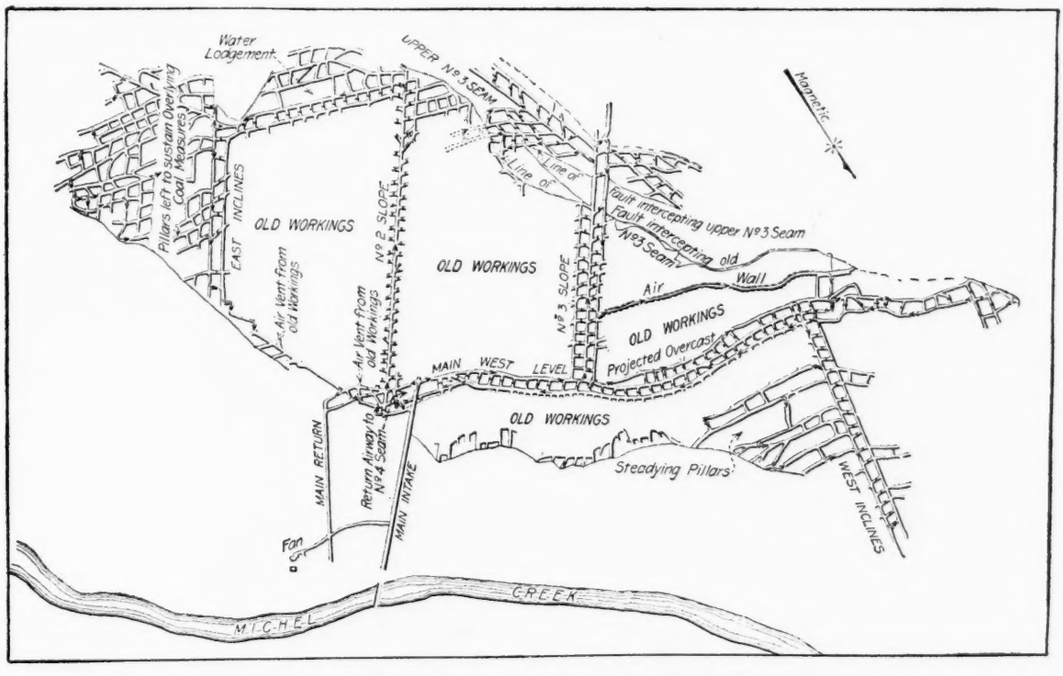


FIG. 2. PLAN OF NO. 3 MINE, MICHEL COLLIERY, CROW'S NEST PASS COAL CO.

TABLE 2. NO. 3 MINE

Sample No.	Date	Where Taken on Return	Average Daily Production in Tons	No. of Men in Mine per 24 Hr.	Volume of Air in Circulation (Cu.Ft. per Min.)	Per Cent. of Methane in Air	Volume of Methane: Cu.Ft. per Minute	Volume of Methane: Cu.Ft. per Ton of Coal Mined
17	Nov. 18, '15	Main Return	250	80	38,500	2.46	947	5,454
22	Dec. 30, '15	Main Return	250	80	37,500	1.03	386	2,223
31*	Feb. 23, '16	South Level	175	..	10,000	2.29	229	1,884
30*	Feb. 23, '16	Right-Side of Slope	40	..	6,000	1.10	66	2,376
28*	Feb. 23, '16	Left-Side of Slope	35	..	9,000	1.83	164	6,747
29*	Feb. 23, '16	Main Return	250	80	37,800	1.01	381	2,194
34	Feb. 24, '16	South Level	175	..	10,000	2.05	205	1,686
35	Feb. 24, '16	Right-Side of Slope	40	..	6,000	1.15	69	2,484
36	Feb. 24, '16	Left-Side of Slope	35	..	9,000	2.26	203	8,352
47†	Apr. 14, '16	Main Return	250	80	40,500	1.89	765	4,006

*Samples taken when the mine was idle.
†Sample taken to replace sample lost en route to laboratory from series of Feb. 24, 1916.

As an illustration of the retention of gas within the coal, in the seams worked through Nos. 2 and 3 mines of the Coal Creek colliery, I recall some operations I supervised in No. 2 mine of this colliery, in 1902. A main-return aircourse was being constructed through an abandoned section that had been worked several years before; the pillars standing in the district being very small led to the belief that the gas would be well drained off; but in every instance the moment cutting began on one of these pillars, which were often less than 10 ft. in thickness, the emanation of gas was such that brattice had to be carried right up to the face in order to permit the continuation of the work.

The volume of gas given off appeared to be greater in the vicinity of the fault lines or those zones in the field where the coal seemed to have been subjected to pressure and crushed. In addition to this heavy emanation of gas, the coal being bituminous and friable, made much fine dust, which was an added anxiety to those in charge of the operations.

The following analyses of the coal in Nos. 1 and 2 seams are typical of the colliery:

No. of Seam	Moisture	Volatile Combustible Matter	Fixed Carbon	Ash
1	0.84	23.59	68.40	7.17
2	1.00	21.85	71.30	5.85

Table 4, which follows, shows both the chemical and technical analyses of the samples taken.

TABLE 4. ANALYSES OF COAL CREEK MINE-AIR SAMPLES

(Edgar Stansfield, Analyst)

Sample No.	Chemical Analysis CO_2	O	CH_4	CO	H	N	Technical Analysis Air	Firedamp	Blackdamp
No. 1 East Mine									
25	0.08	20.35	1.87	....	....	77.70	97.23	1.87	0.90
27	0.10	20.54	1.23	....	....	78.13	98.14	1.23	0.63
39	0.09	20.49	1.49	....	....	77.93	97.90	1.49	0.61
40	0.11	20.22	2.73	....	....	76.94	96.61	2.73	0.66
41	0.14	20.06	2.97	....	....	76.83	95.83	2.97	1.19
48	0.10	20.40	1.73	....	....	77.77	97.47	1.73	0.80
49	0.12	20.36	1.67	....	....	77.85	97.28	1.67	1.05
50	0.10	20.38	2.04	....	....	77.48	97.37	2.04	0.59
No. 3 Mine									
17	0.22	20.46	2.46	....	....	77.22	96.03	2.46	1.51
22	0.09	20.56	1.03	....	....	78.32	98.23	1.03	0.74
28	0.06	20.54	1.83	....	....	77.57	98.14	1.83	0.03
29	0.09	20.65	1.01	....	....	78.25	98.66	1.01	0.33
30	0.12	20.66	1.10	....	....	78.12	98.71	1.10	0.19
31	0.15	20.32	2.29	....	....	77.24	97.09	2.29	0.62
34	0.16	20.30	2.05	....	....	77.49	96.99	2.05	0.96
35	0.10	20.55	1.15	....	....	78.20	98.18	1.15	0.67
36	0.11	20.36	2.26	....	....	77.27	97.28	2.26	0.46
47	0.15	20.38	1.89	....	....	77.58	97.37	1.89	0.74
No. 1 North Mine									
19	0.09	20.63	0.45	....	....	78.83	98.57	0.45	0.98
23	0.11	20.63	0.33	....	....	78.93	98.57	0.33	1.10
44	0.07	20.85	0.27	....	....	78.81	99.62	0.27	0.11
No. 1 South Mine									
20	0.23	20.11	1.85	....	....	77.81	96.08	1.85	2.07
43	0.05	20.66	1.14	....	....	78.15	98.71	1.14	0.15
46	0.08	20.56	1.28	....	....	78.08	98.23	1.28	0.49
No. 2 Mine									
15	0.11	20.54	0.87	....	....	78.48	98.14	0.87	0.99
32	0.09	20.40	1.42	....	....	78.09	97.47	1.42	1.11
33	0.09	20.48	1.39	....	....	78.04	97.85	1.39	0.76
"B" Mine									
21	0.13	20.47	1.38	....	....	78.02	97.90	1.38	0.82
38	0.10	20.69	1.09	....	....	78.12	98.85	1.09	0.06
51	0.06	20.67	0.78	....	....	78.49	98.76	0.78	0.46

Note—The "technical analysis" has been calculated from the chemical analysis by taking air as having the following composition: Oxygen, 20.93 per cent.; nitrogen, 79.04 per cent.; carbon dioxide, 0.04 per cent. All the excess inflammable gases are then reported as "firedamp" and the excess extinctive gases as "blackdamp."

In conclusion, the foregoing tables clearly show that this coal field is very gaseous. The Michel colliery with three mines shows the average of 38 samples to be 3,837 cu.ft. of methane, per ton of coal mined, while the Coal Creek colliery average of 30 samples was 2,030 cu.ft. Taking the field as a whole, these 68 samples show an average outflow of 3,040 cu.ft., per ton of coal mined.

In Bulletin No. 72 issued by the United States Bureau of Mines, and entitled "Occurrence of Explosive Gases in Coal Mines," N. H. Darton treats extensively with the outflow of gases in the principal coal fields of the world and especially in the anthracite field of Pennsylvania and the southern portion of the Illinois field. In his summary, page 229, Mr. Darton, speaking of the outflow of gas at certain mines, says:

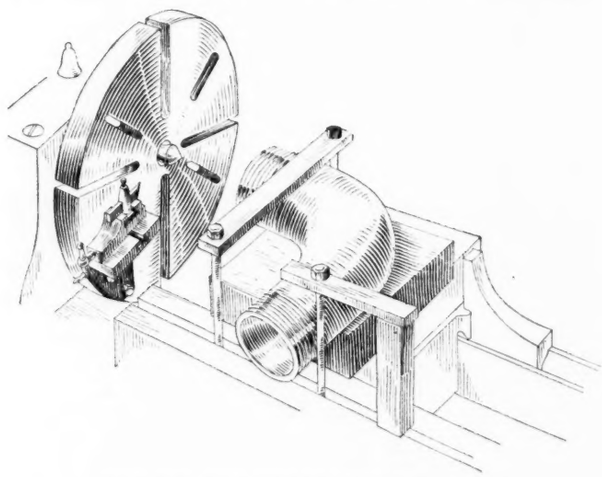
> Among mines with large outflow of gas, those near Wilkes-Barre, Penn., lead with 2,000 to 3,500 cu.ft. per min., and some of the more fiery of the Prussian mines range from 400 to 625 cu.ft. Figures of this character have to be considered in connection with extent of workings and tonnage of output and the data for these factors are given in but few instances. In the Saarbrücken basin the volume varied from 16½ to 2,160 cu.ft. to the ton of coal mined, while in the gaseous mines near Wilkes-Barre the rate ordinarily ranged from 2,000 to 3,850, with an average of about 1,500 cu.ft. per ton. In some Austrian mines the rate ranged from 519 to 7,469 cu.ft.; at Gemeinschaft and Ath-Gouley the rate per ton was 409 to 3,360 cu.ft. and in two fiery French mines the figures given are 883 and 1,377 cu.ft. In the deeper mines in southern Illinois the amounts varied from 50 to 260 cu.ft. per ton.

The mines operated in the Crow's Nest Pass coal field, at Michel and Coal Creek, with an average outflow of 3,040 cu.ft. of methane per ton of coal mined, may therefore be classed as being among the most gaseous mines known.

A reference to the table giving the chemist's returns shows but one sample of the entire 68 where the oxygen content of the mine air fell below 20 per cent. It is the intention to continue this work during the year.

Threading Ends of Bent Pipe

The problem of utilizing short pieces of bent pipe is an ever present one about metallurgical plants of all kinds. Such a policy of utilization keeps down the size of the junk pile and helps toward increasing profits, besides being a great comfort in times of urgent need. Therefore the method described by H. J. Smith, in



THE RIG FOR THREADING BENT PIPE

American Machinist, Nov. 2, 1916, and shown in the accompanying illustration, is worth while putting on record. By putting an angle plate with a small compound rest on the faceplate, the operator was enabled to use a lathe for the purpose. The pipe was fastened in blocks on the carriage, as shown in the illustration. By running the lathe backward it was possible to cut off, turn and chase the thread.

Making Carelessness Impossible*

By Joseph Knapper†

SYNOPSIS—After discussing the future of the Coal Mining Institute of America, the writer urges on the industry that in many cases negligence is shared between workman and employer and that an accident would not occur if the former had used every provision of safety. Safety lamps are made secure by locks, and gaseous rooms can be made safe only by locked doors or gratings.

The Coal Mining Institute of America is perhaps never destined to be as we once planned, the leading and only national coal-mining association in the United States, for it now has many rivals in other states—not so old, not so large, but just as worthy of preservation. We cannot look for any primacy other than a quality of being first among equals. Ours is the largest coal-producing state; ours is a state where the coal area is fairly well centered; our coals are among the best on the continent. There is therefore no reason why we should not lead. If we are underlings, the fate is in ourselves and not in our stars.

Someone has said, "Let us have another national coal-mining institute." We had one a few years ago—the Coal Mining Institute of America. It found the field too big to be covered, and it would appear that any other institute that might be founded would find the same was true of it.

But if we fill the Keystone state, or only the bituminous part of it, with our activities, we shall do something worth the while. If our work is worthy enough, we can draw from other states; for every one recognizes the force of the great state of Pennsylvania—her leadership as a coal state, the peculiar power she seems to have of developing mines of the largest productive capacity, and the credit she undoubtedly has of having developed the methods of mining most economical of coal of any in this country. Only one state has been more frugal of her coal, and that state is West Virginia; and she is still most unequally prudent in the various parts of her domain. But we must never forget that West Virginia took her first lessons in coal conservation from the Keystone state.

We have a great opportunity. I welcome you here today trusting that you will convert that opportunity into early accomplishment. It lies wholly within our own powers. If we will be alert and ready to march with tomorrow instead of today, if our ideas are abreast with the next decade of time instead of the last, or even the one before, if we have concrete schemes in black and white, then we will have the wise men of the East of our company. But if we drone and muse and lament, if the past is all we consider, we shall come short of the needs of the hour, we shall throw aside our opportunities, and mistaking the starting post for the goal we shall wind back to a valueless finish.

It is customary at the annual meeting of the institute for the president to address a few words on some matter which appears to him of vital interest to the institute and the mining public, and the occasion seems fitting for me to make some remarks on the subject of the carelessness of mine workers. We have been prone to credit that defect of the workingman with a large percentage of accidents, and the result has been somewhat unfortunate, because the conclusion we have so uniformly arrived at is extremely offensive to the workingman and arouses his antagonism and because it brings the operator and his executive aids squarely up against a stone wall.

So long as the operator could avoid paying compensation by charging the workman with contributory negligence it was natural for him and his attorneys to gloss over his own responsibility by allegations of this sort. There was a desire to expand carelessness or negligence to cover every accident. As a rule, as we well know, it was possible in nearly every case to find an item of negligence on the part of the employee. It was nearly always the last item, which added to other items, made the accident happen. Without that item the accident would not have occurred.

The victim had to add merely his negligence to spring the trap which too often lay open before him. If a board was missing in a walk, it did not make an accident certain—merely possible or likely. The element of neglect, carelessness, or something we usually have left undefined, perhaps because it is indeterminable, was needed to complete the accident. If the man knew the board was missing, if he had been told not to go to that part of the works, he was negligent; and the employer was excused for all the worse neglect he, the employer, had shown, which neglect made the accident not merely likely but probable.

Change of Law Does Not Help Employer

But with a change of law it does not help the employer if he finds a satisfactory excuse. He has to pay in any event, and as he desires to cease paying so often, he is pleased to narrow down the number of accidents he can charge to anything so relatively irremedial as carelessness. He tries to divide all the forms of frailty which hitherto he has grouped together under one ill-considered class and termed negligence.

If he is going to be successful in lowering his death or casualty rate, he takes a positive delight in finding in each accident some contributory negligence on his part that makes himself partly to blame. For if he can only find in nearly all possible accidents a reflection on his own mismanagement, he feels he can remove all these accidents by withdrawing the item from the total without which a completed accident could not have occurred.

This is an advance from past thinking, and I am sure it will meet with some opposition even from some of the best of men. A little reflection will show, however, how we are progressing in our analysis of causes year by year. Let me quote some interesting passages from an address delivered by the great woman essayist, Ida Tarbell, before the National Safety Council at its Chicago meeting in 1914. She said:

> There has been a superstition in regard to accidents. An accident was something inevitable. It was fate. You know

*Presidential address delivered at the meeting of the Coal Mining Institute of America at Pittsburgh, Penn., Dec. 6.

†State mine inspector, Philipsburg, Penn.

how the old-fashioned workman talked. If he was a pious workman and he lost a leg, he said it was God's will. If he was not a moral man he said it was coming to him, and the men beside him said, "I am going to get mine some time." That was the way workmen in general talked 15 or 20 years ago.

And the men at the head of the factory or railroad had the same attitude. "Well, accidents are unavoidable; that is one of the prices we pay for progress." Blood, shattered bodies, that was the price we were paying and the public agreed that it had to be paid. We were all apathetic. We said, "Well, we cannot build a great community, or railroad, or factory, or have mines, we cannot get rich, we cannot develop, without a blood toll." And we accepted it. Now you gentlemen have broken with that superstition. You have said: "Accidents are avoidable."

We will learn after a while also that if we would have no accidents we must try and make carelessness impossible. The Ford Motor Co. uses a giant pair of shears in its operations. A careless man might get his hands or his fingers under the blade. The motor company has taken the Biblical injunction, "If thy hand offend thee, cut it off," quite literally. Realizing that if the man had the unrestricted use of his hands he might use them to clog the machine and make an unpleasant muss around, the company deprives him of the use of them when the knife comes down by requiring him to press two buttons at distant points at one and the same time in order to put the knife in operation. It is a physical impossibility for him to cut off a hand, for if his hands are not on the buttons the blade does not come down; and if they are on the buttons, the murderous blade cannot harm them. I am told that this was one of the most interesting exhibits at a recent National Safety Council meet.

Accidents Due to Preoccupation

But I have said that much that we have called carelessness is not rightly so designated—for it is not culpable as all real carelessness is. Many accidents are due to preoccupation. The man is thinking of something else, he is exercising what psychologists call concentration. That is the nice word for it—the word we use when we want it regarded as a virtue and something to be sought. Practical men term it woolgathering and absentmindedness.

It is an evidence of a one-track mind. But it is not wicked or culpable or often any real evidence of mental inferiority. The strongest and best minds have been possessed by such concentration of thought, and while the thought persisted there was a great risk of accident. Moreover, men of passionate temperament, who love or hate strongly, who have unhappy homes or who are discontented, are quite likely to fall into brooding spells in which they are oblivious to danger.

Then it is that safeguards are needed to protect them against dangers which in more normal moments are not dangers at all. The trouble with us is that we regard men as always normal and in an attitude of healthful self-defense, but we know that we ourselves are frequently subnormal, brooding and thoughtless, and we may anticipate the same of others.

That is why we must, if possible, leave men but few chances to injure themselves. I do not say no chances at all, for I can readily think of some we can hardly fence off. Our trouble is that we say, "He ought to have used a little care or some judgment." But perhaps it was not his day for care or judgment. He was the happy father of a boy, or he had been at a festival or a wake, or he had quarreled with his wife, or he had forgotten his oil can and was in the dark, or his mind was set on his work—the filling of his car or the preparing of his cartridge.

As an example, we trust too much to danger signals. A door, a brattice, a bar and a lock are better. A railroad company might depend on a sign to tell a man that he was approaching a low bridge, but realizing the importance of the warning, they put up something like a cat-o'-nine tails—knotted cords—which tell the message with certainty, so that it will not be overlooked. Our danger signs are better than they used to be, especially when set up as they should be on a bar; but a door and sign is better yet—a grating and sign if a door is not permissible.

Dangerous Places May Be Locked Up

The danger is not merely to one man, but maybe to 500, and certainty is worth while. We cannot allow the carelessness of any one man or his ignorance to jeopardize a whole army of men, and if we do not take reasonable precautions we ourselves have been careless. In fact it may yet be that we will not only put doors or gratings on gaseous rooms, but keep them locked at night. In the morning no miner will be able to enter until he has secured the key from the fireboss.

We lock up safety lamps, though it is not at all necessary if no one is careless enough to open them. But there's the rub. Will they be so careless? Just in the same way, it is useless to lock up a gaseous room. Only a careless man will enter it. No doubt that is true, but after our mine is wrecked and some hundreds of miners are dead, will the fact that one man was careless sustain us against all the blame and the horror of it. It certainly will not enable us to endure the cost—enough to bankrupt the most stable of companies—unless, indeed, it is insured.

Perhaps we shall find that the practice of avoiding unsafe men is one of the best ways of safeguarding. In the system of insurance rating it is impossible to reward operators who will not put risk takers into places of danger and who carefully, by patient instruction at the place of work, post their mine workers as to the dangers to be encountered. The present admirable system of insurance in force in Pennsylvania, like all splendid systems, has its drawbacks. It rewards the operator for certain provisions he has made. It does not consider the past record of the mine.

Perhaps it will do that later. But the result of such a system is to reward what theologians term the deadly doing of prescribed acts, rather than the spirit of safety which should be reflected in results. The risk takers and the woolgatherers should be weeded out. They have no place in a mine. But safety will be most nearly secured when we try and convince ourselves that "carelessness" must follow closely the heels of "fate" as a cause of accidents. As far as we can we must make even carelessness impossible.

Mother of Coal Is a High-Grade Fuel of different composition from that of the rest of the coal seam, according to E. A. Holbrook in "Dry Preparation of Bituminous Coal at Illinois Mines," University of Illinois Bulletin No. 88. He states that a sample taken from a band ½ in. in thickness, occurring in seam No. 6 in Williamson County, Illinois, and analyzed under his direction, gave the following approximate analysis: Moisture as received, 0.16 per cent.; volatile matter, 9.75 per cent.; fixed carbon, 87.47 per cent.; ash, 1.72 per cent.; and sulphur, 0.90 per cent.

Problems in Byproduct Coking

SYNOPSIS—The mechanical side of byproduct coking has apparently reached perfection, but there is still much to be learned in the selection and proper mixing of different coals.

How much has already been done and how much is left to be done were the salient things brought out in a presentation of the subject of byproduct coking before the Metallurgical and Mining Section of the Engineers' Society of Western Pennsylvania, Tuesday evening, Nov. 28. The speaker was C. J. Ramsberg, second vice-president of the H. Koppers Co. The subject was presented with the accuracy of detail that occurs with the reading of a formal paper, and yet with the interest that is developed by an actual inspection of works, as there were many lantern slides shown, together with two reels of "movies." The subject as announced, indeed, was "A Personally Conducted Trip to the Koppers Byproduct Coke and Gas Plant of the Laclede Gas Light Co., St. Louis."

What is evidently accomplished is the development of the proper proportions for the retort, and in particular the precise width, a matter that was perhaps not regarded at first as important as it has since been shown to be. The machinery for operating the retorts appears to be perfectly adequate for the duties required. As for the recovery of byproducts, the equipment is well developed, though various refinements will no doubt occur in the future.

On the great subject of the selection and mixing of the coals to be used in the byproduct process, the speaker frankly confessed there is much yet to be learned. Perhaps we know less now than we thought we knew a few years ago, for experience has shown that some things thought possible cannot well be accomplished, while other things that were thought impossible have been done quite successfully.

Society of Byproduct Engineers

The art of mixing coals for byproduct coking is in its infancy. Many coals have been tried and many of them have produced good results, but as byproduct coking plants are now built, and will be built, at many points widely distributed, the matter of freights is of the greatest importance, the most economical mixture at one point being an unnecessarily expensive mixture at another point. It was suggested that the time was ripe for the formation of a society of byproduct coke engineers who would compare experiences and build up a literature.

The Koppers Oven

The Koppers oven is from 37 to 40 ft. long, from 7 to 9 ft. high and from 18 to 20 in. wide. These are broad figures, used merely to give a general conception of the plant. The ovens are built side by side in batteries of 50 or more retorts. Each retort has gas and air inlets at each side, there being regenerators underneath, alternated every 30 min., whereby the air is reheated. The leaner part of the gas produced in the coking operation is not preheated. The Laclede plant is so constructed that if in future the standard of gas required by the city service should be slightly reduced, all the gas produced could be thus used, and the ovens would then be served by producer gas, made from coke breeze, etc., available at the plant. This producer gas would then be preheated the same as the air. Blast-furnace gas, which carries a great deal of heat, can be used; and in Germany there are many byproduct coke plants so operated, the oven gas being used more profitably in other ways than to operate the ovens.

At the crusher and mixer building the coal is crushed and mixed, the major part passing through a ⅛-in. mesh screen. The ovens are charged one by one in rotation by a larry running on top of the battery, through a series of charging holes. The pushing machine, operated entirely by electricity, runs along the "pusher side" of the battery. It carries at its top a flat bar for leveling, the bar being thrust through a small door at the top of the "pusher" end of the retort. The small door is hinged to the main door underneath.

A door-handling machine removes the entire door and carries it away to make room for the pusher, which in a few seconds pushes out the entire charge, en masse. The door-handling machine then promptly replaces the door, both operations being performed with mechanical exactness, quite impressive when shown by the motion picture film. The film then takes one to the other side of the battery, the "coke side," where the mass of coke is seen emerging solidly from the retort, a corresponding door on this side having been removed.

The coke breaks in two solid streams of larger and smaller pieces, the line of demarcation being very precise down the center. The carbonizing process, it appears, is absolutely regular. The heat proceeds inward uniformly from each side of the retort. After ten hours of coking, the center plane of the coal is at a temperature not much, if any, above the boiling point. Between that which is coke and that not coked there is an impervious film of tar, and the coking process, during the 16 or 18 hr. of coking time, is really the gradual movement of these two tar films from the sides inward until they meet at the center, there forming the line, or plane, which causes the coke when ejected to fall in two distinct streams.

The Time of Coking

Roughly speaking, the movement of this tar film is about one-half inch per hour, or about one inch per hour coked of the total width of the retort. It appears that the time of coking is no longer guesswork, nor is it desirable to hasten or retard the operation. Thus the coking time is really a function of the width of the retort. The height and length appear to have been arrived at by the Koppers Co. through consideration of mechanical and structural conditions. With these standards, Koppers ovens have been built 19¾ in. wide, yielding 13¼ net tons of coke, but the latest have been 18¼ in. wide, involving 12¼ tons of coke and requiring for the best results a coking time of 18 hr. No further variations from this are to be expected.

The coke as discharged falls into the quenching car, which can handle two charges in case of emergencies, but normally operates with one charge. It passes promptly to the quenching tower, where a deluge of water falls upon it, effecting the quenching in about 40 sec. A hood carries off practically all the steam. The quenching time is made short, so that the interior of the coke will remain

hot, whereby it subsequently dries itself, and coke is regularly produced at the Laclede plant not exceeding 2 or 3 per cent. moisture. At one operation coke was produced for a time with only 0.7 per cent. moisture.

Through the entire coking process, but not including the departments for the recovery of various byproducts, the Laclede operation requires the services of 33 men, the total of the day and night turns, so that as 990 tons of coal are charged per day there is one man for one turn against each 30 tons of coal converted into coke. Practically all the operations are mechanical, with the exception of luting the doors at each end of the retort after they have been set precisely in place by the door-handling machine. While the fit is mechanically good, the luting is necessary. Common clay is used, and the operation requires a few minutes. The dried clay which drops upon the removal of the door is returned to the mud mill to be prepared for further use.

Value of Byproducts

Mr. Ramsberg presented the following statement of value of the primary byproducts, per ton of coke produced:

9,000 cu.ft. gas, 550 B.t.u.	$0.60
12 gal. tar	.35
33 lb. ammonium sulphate	.99
4½ gal. benzol	.50
100 lb. coke breeze	.12
Total	$2.56

The gas value is figured on the steam plant basis, using the market price of natural gas as the factor. Tar is taken at the ordinary market value. The value given for ammonium sulphate was stated to be the ordinary market value, the present market rates being $1.40. The benzol was taken at its value when used as motor fuel, against gasoline. The coke breeze is taken at its heating value.

The coke produced at the Laclede plant is separated by rotary screens, according to size, into furnace, foundry and domestic coke.

As already remarked, the manufacture of byproduct coke, once the coal is furnished, has been reduced to an exact science, and equipment is available that appears to work perfectly. Apparently it is not by any means a case of adapting the oven to the coal. It is a case of selecting the coals and mixing them in the best proportions. On this subject there is still a great deal to be learned. Past experience is not necessarily a criterion, for coals that have been used in various ovens and tried afresh in an oven of the proportions now regarded as standard may behave differently. Evidently a great deal more is to be learned in the future than has been learned thus far.

Oxygen in Coal

As one travels west in the United States, he finds that the oxygen content of the coals increases, and with increased oxygen the coke produced does not cohere. The southern Illinois coal, of which apparently much was expected some years ago, is not now a favorite. The Gary plant did run for a while on 100 per cent. southern Illinois coal, but the regular practice is otherwise. A mixture of southern Illinois and Pocahontas coal might produce good results.

The Inland Steel Co. formerly operated its plant at Indiana Harbor on 60, 70 and 80 per cent. Pocahontas coal, which is low volatile. Since then it has been using a larger proportion of high volatile coal. Vagaries in this matter certainly appear. For instance, at one plant there had been made, from 85 per cent. high volatile and 15 per cent low volatile, a coke which showed the same consumption per ton of pig iron produced as standard Connellsville coke and yet enabled the furnace to produce 10 per cent. more pig iron. A mixture recommended for the middle states is 85 per cent. high volatile and 15 per cent. low volatile, not because such a mixture is best per se, but because freights and other considerations vary the cost of coal delivered at the coke plant. What is desired is to produce the greatest value from the materials available, in byproducts and in performance of the coke in the blast furnace or other use, in terms of the unit cost.

The influence of the respective classes of coal is that excess of high volatile coal makes too dense a coke, while increasing the proportion of low volatile coal opens up the cell structure. These things are just being learned. The Pocahontas coal of West Virginia and the Somerset and Cambria coals of Pennsylvania are all low volatile.

At the Laclede plant the regular mixture is 60 per cent. Elkhorn, Kentucky (high volatile) and 40 per cent. Pocahontas, West Virginia (low volatile), the resultant mixture averaging 27½ per cent. It must be remembered, however, that the Laclede plant is not typical of the majority of plants attached to blast furnaces, as their primary purpose is to produce coke, while the Laclede plant is designed to produce gas for the City of St. Louis, the coke being in a sense a byproduct the same as the tar, ammonia, etc.

Meeting of the West Virginia Coal Mining Institute

The eighteenth semiannual meeting of the West Virginia Coal Mining Institute will be held Dec. 12 and 13, 1916, in the Assembly Room of the Hotel Frederick, Huntington, W. Va.

On Tuesday morning at 9:30 addresses of welcome will be made by E. Sehon, mayor of Huntington, and C. P. Snow, president of the Chamber of Commerce, followed by a presidential address by J. C. McKinley, of Wheeling, W. Va. The papers to be read at this session are: "Is Coal Mine Efficiency Engineering Justified?" by C. H. Elsom, of Charleston, W. Va., and "Better Understanding and Relations Between the Mining Industry and the Railroads," by H. H. Morris, Huntington, W. Va. Discussion of the papers will follow.

The afternoon of Dec. 12 will be devoted to an inspection of the byproduct coking plant at Ashland, Ky., leaving Huntington by boat at 1 p.m.

At the Wednesday morning session, starting at 9:30, a symposium will be held, the subject being "Efficiency in Its Relation to Labor Shortage," with Josiah Keely, of Kayford, W. Va., presiding. A paper on "Latest Improvements for the Preparation of Bituminous Coal" will be read by Warren Roberts, of Chicago, Ill., followed by the annual report of E. N. Zern, secretary-treasurer, business session and election of officers.

In the afternoon, at two o'clock, a symposium on "How May the Workmen's Compensation Law Best Operate To Effect a Reduction of Mine Accidents" will be held, Karl E. Schoew, of Huntington, W. Va., presiding. The following papers will then be read: "Electric Haulage in Mines," by J. R. Brown, of Mansfield, Ohio, and "The Synchronous Converter for Coal Mine Service," by H. D. James, of Pittsburgh, Penn.

Disposal of Waste Material

In eastern Kentucky, throughout Letcher, Knott and Pike counties, the Elkhorn coal fields are being rapidly developed. About six years ago the Consolidation Coal Co., with main operating offices at Fairmont, W. Va., and executive offices at Baltimore, Md., acquired 100,000 acres of this coal and shortly afterward began development. At present 15 mines of this firm are in operation, all of which are modernly equipped and efficiently officered.

As is usually the case with coal mines where the coal receives preparation for market, a certain amount of refuse from the tipple must be disposed of. This problem here presents unusual difficulties. The valleys between the mountains are narrow and deep, and what ground is advantageously located for refuse disposal is occupied by dwelling houses and company buildings of one sort or another, leaving no space available for slate disposal. Conditions, therefore, necessitated conveying this material to a more distant point. This was accomplished by employing a combination of the aërial tramway and an electrically operated larry. The latter operates between the discharge bin and the dumping ground.

The dump is located in a valley beyond the ridge of mountains nearest each mine opening. This made it necessary to convey the material from the mine tipple to the top of the mountain in order to permit the operation of the larry along the top of the mountain, and dump the refuse down into the valley beyond.

The most pertinent question to be solved was the conveying of the refuse from the tipple to the top of the mountain. After carefully considering various means it was finally decided to adopt the double reversible system of aërial wire-rope tramway equipped with automatic dump buckets of the bottom-dump, self-closing type. This type of conveyor was considered to be the most economical that could be installed, as only one man is required to operate it and it required a minimum amount of power. Power is required in this case, as the loads travel from a lower to a higher elevation.

At the present time there are four of these double reversible tramways in operation, and one is in course of erection. These vary in length and are located as follows: 550 ft. long at Mine No. 210; 1,018 ft. long at Mine No. 214; 1,035 ft. long at Mine No. 215; 820 ft. long at Mine No. 207, and 950 ft. long at Mine No. 206. The last named is in course of construction. Each of the tramways has a capacity of 30 tons per hour, the refuse weighing 80 to 90 lb. per cu.ft.

Each tramway is equipped with the well known locked-coil track cables, 1½ in. in diameter on each side. The movement of the carriers, of which there are two on each tramway, one operating back and forth on each track cable, is controlled by a $\frac{9}{16}$-in. crucible cast-steel traction rope. Power is furnished by electric motors, direct-connected to the driving shaft.

A good idea of the details of construction and operation of the aërial tramways can be secured from the photographs reproduced herewith. Fig. 1 shows the loading terminal at the tipple of Mine No. 207, with the bucket in front of the chute ready for loading.

Fig. 2 shows the discharge terminal and bin for the tramway at Mine No. 207, with the tramway bucket just about engaging the tripper preparatory to discharging its contents. In front of this bin can be seen the larry used for distributing the refuse to the waste heap. This larry operates on a surface track laid close to the edge of the dump. As the width of dump increases, the track is shifted over close to the edge, so as to facilitate dumping into the valley.

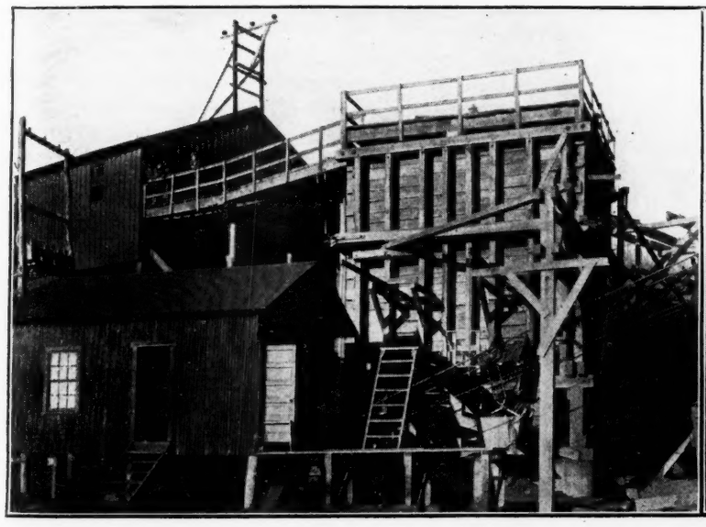


FIG. 1. LOADING TERMINAL AT TIPPLE

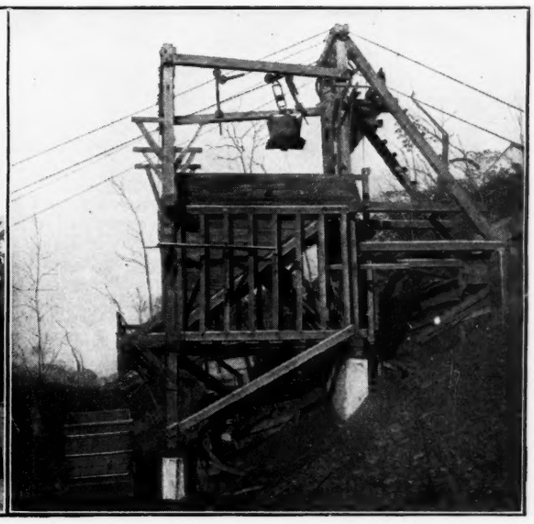


FIG. 2. A DISCHARGE TERMINAL

The tipple at Mine No. 215 is provided with an aërial tramway extending from a point beneath the tipple, and on the near side of the railroad tracks, to the top of the mountain where the refuse is discharged into a bin similar to that shown in Fig. 2. The tramway at this installation crosses the railroad tracks at an elevation such as to preclude interference with traffic.

All the aërial tramways mentioned in the foregoing are of the American Steel and Wire Co.'s manufacture, and have been successfully and economically transporting the tonnage for which they were designed. They illustrate, in a practical and conclusive manner, the economical advantages of this method of disposing of waste materials. —*Engineering and Mining Journal.*

Relative National Aid to Mining and Farming*

By Van H. Manning†

If mining obtained as much consideration as agriculture, considering the relative value of the outputs of the two industries, it would be granted nearly four times as large appropriations from the Federal Government as it now receives, or $8,018,560 instead of $2,333,075. The Federal Government, in the present year, has donated to the farmers $1 for every $295 worth of products of the farm. It has donated to mining $1 for every $1,017 worth of products from the mines.

The total amount of money appropriated by the Federal Government in behalf of agriculture for the present fiscal year is $35,553,852. The total amount of money appropriated by the Federal Government for this year for mining is $2,333,075. This includes the total appropriations of the Bureau of Mines and the United States Geological Survey.

The per capita contribution of the people for the betterment of agriculture is 34.8c.; that for the betterment of mining is 2.3c.

The per capita production of agriculture is $102.94; the per capita production of mining is $23.26. While the value of the agricultural production of the country is less than five times that of the mineral production, the per capita appropriation for agricultural investigations is fifteen times the per capita appropriation for mineral investigations.

Weathering of Coal

By E. B. Wilson

Bulletin No. 338, of the Canadian Department of Mines, has been prepared by Dr. J. B. Porter, of McGill University, who had for his assistants S. L. Brunton, J. B. deHart, E. E. Billington, A. E. Cameron and Edgar Stansfield. This extra volume, supplementing Report 83 on the Coals of Canada, contains information compiled through search and research and with the conclusions drawn furnishes reading matter that will be interesting and instructive to the layman and savant.

The weathering of coal, in nature, takes place at the outcrop of the bed, while artificial weathering commences the moment the miner's pick exposes a coal surface to the mine atmosphere. In the latter case the weathering continues through the preparation, transit and storage of the coal. The term "weathering," as used in Bulletin 338, covers the oxidation of the coal, thus bringing into the discussion the temperature of mine atmospheres and spontaneous combustion, both in the mine and in outside storage piles.

After citing the methods of conducting experiments at Glace Bay and Angus, recommendations are advanced for the prevention of fire in stored coal. The book contains 194 pages of reading matter with index and bibliography. It is because of the annotations made from various writers that the term "search" was used, as in the reviewer's estimation these compilations form a very important part of the book.

*Excerpt from article entitled "Federal Aid to Mining Efficiency," read before the American Mining Congress, Nov. 15, 1916.

†Director, United States Bureau of Mines, Washington, D. C.

IN LIGHTER VEIN

A Parallel to the Coal Shortage

At the recent banquet of the Philadelphia Coal Club, Mr. Noah Swayne, prominent in the trade at Philadelphia, in responding to the call of the toastmaster, made quite a hit by relating the story of an incident that took place on the good ship "Ark," during a personally conducted tour by his late ancestor Noah. It so ably portrays present conditions in the retail trade, with every dealer up to his ears with orders and not able to secure one-fifth enough coal to fill them, that we feel it will bear repetition:

While ambling around the port side of the ark, Noah came upon Ham and Jephthah in earnest colloquy, with the latter shedding copious tears.

"Why, Jeppy, old scout, what's the matter?" anxiously inquired brother Ham.

"Boo, hoo!" wailed Jep, "to think that there's so much fishing and only two worms to do it with!"

He Wanted To Warn the Motormen

A new man was hired to wheel ashes at the power house of a certain large mine. As his duties did not keep him employed all the time, he found much amusement in sitting on one of the cylinders of the hoisting engine, which is wood-jacketed, and watching the variable load on the ammeter and the circuit breaker flying out. This was an everyday performance. Finally his curiosity mastered him and the following conversation took place.

"Say, Bill, what makes that little thing behind that glass go from one side of the dern thing to th' other?"

"That is the ammeter," answered the engineer, "and its purpose is to show the load in amperes that is on the generator. On the voltmeter you see that the voltage is 250 and the ammeter registers 600 amperes. By multiplying the two together we get the watts. There are 746 watts in a horsepower——."

"Yes, I guess you're right about all of that stuff, but what makes that dern thing there smash out so often?"

"You see, Hiram," said the engineer, "the circuit breaker is adjusted to 'kick' at 900 amperes; there are ten coal-cutting machines and two large haulage motors. Usually, when the motors have heavy trips and are both pulling at once——."

"Do they get th' juice off them wires that go down th' shaft?"

"Yes."

"Well, all I got t' say is this, If them motormen don't quit pullin' so blasted hard on them wires, they're goin' t' break 'em an' then they'll git h—— knocked clean out of 'em."

COMING MEETINGS

Tenth Chicago Cement Show at Coliseum, Feb. 7 to 15, 1917. Secretary, B. F. Smith, 210 So. La Salle St., Chicago, Ill.

The West Virginia Coal Mining Institute will hold its winter meeting Dec. 12 and 13, 1916, at the Hotel Frederick, Huntington, W. Va. Secretary, E. N. Zern, Morgantown, W. Va.

The Rocky Mountain Coal Mining Institute will hold its winter meeting at Denver, Colo., in the Convention Hall of the Albany Hotel, Jan. 22-24, 1917, beginning at 10 a.m. Secretary, F. W. Whiteside, Denver, Colo.

The Labor Situation

General Labor Situation

The anthracite companies, especially the Delaware, Lackawanna & Western R.R. coal department and the Lehigh & Wilkes-Barre Coal Co., would like the miners to work on Sundays and Thanksgivings and extra hours on other days to mitigate the coal famine. Meantime, John P. White, the president of the United Mine Workers of America, is calling for the 7-hr. day because the miners are producing too much coal. He repeated his argument at Christopher, Ill., on Dec. 3. It seems to be his leading plea in his stump for re-election.

If John P. White would show a little more consideration for the public, and advocate a full tonnage now—not Sunday or Thanksgiving work, but at least an honest 8-hr. day—he would keep the mining field in better shape for the future. This present coal shortage is going to increase the number of mines throughout the country. White declares that there are already too many. Steady work on the part of the miner would largely remove the shortage, lower the price of coal and prevent a large increase in the number of mines.

On the whole, the miners in the anthracite region are now rather quieter than usual. Lynch & Co., button manufacturers, of Chicago, Ill., may be the cause. They are short of tin and wire and have delayed the shipment of union buttons to the unions. The due-book system may be substituted for the buttons, or cards may be used.

But what has been said about quiet conditions does not apply to the northern anthracite field. That section has all the time troubles of its own. One difficulty has just been settled. The Delaware & Hudson Co. has agreed to abolish the contract mining system, which is a plan by which certain men agreed to furnish coal to the company and then hire men by the day to mine it.

They are not contract miners in the sense in which the term is used in the bituminous region. There it means men who mine by the ton and not by the day. In the northern anthracite region the term contract miner has more the meaning of contractor. He is an employer of labor and does not himself mine all the coal that he furnishes. The union has long regarded these contract miners as inimical to its interests and has urged that their employment is a violation of the mine agreement.

Another Difficulty Has Arisen

While this difficulty is settled, another has arisen. Sixteen motor runners at the Coalbrook mine of the Delaware & Hudson Co. at Carbondale struck on Dec. 2 for a uniform rate of 28c. per hr. The rate has hitherto been 24c. during the first six months of work, 26c. for the second six months and 28c. thereafter.

The miners in the anthracite region propose to make a strong legislative fight for assuring control of the inspectorate in the anthracite region. Mine inspectors in that region are elected, but they have to qualify prior to election by going before an examining board. This board now consists of three miners and two mining engineers, but a majority is not sufficient for control of the action of the board, and it has been the practice to qualify only as many men as there were inspectors to elect. Thus the boards practically controlled the elections, and it is said that as a result the minorities have ruled the action of the boards. The miners want the control of the boards placed with the majority, no matter how small it may be, and they desire that the inspectors be placed on a nonpartisan ticket. They also favor a provision that the inspectors be chosen from mine employees exclusively and not from among men occupying official positions in the service of the mining companies.

The strikes in the Moshannon section of Clearfield County continue. The Moshannon Coal Co., which has an agreement with the miners running till Apr. 1, 1918, shows a disposition to concede a temporary increase of 33⅓ per cent. to its men. The company stock is largely owned by Charles Rowland, the congressman from that district. Suit has been entered by other operators to restrain him from modifying his contract, his fellow coal producers declaring the association's by-laws provide that the members shall be bound by the action of the association. The operators claim that the Moshannon Coal Co. is not free to make a new contract with its men.

In Somerset County the union has made some progress in the unionizing of the men engaged at the Pretoria mine of J. Blair Kennerly. At the other mines there have been slight gains in the working forces. The car supply is improving.

The trouble between the Rockhill Iron and Coal Co., at Robertsdale, Huntingdon County, Pennsylvania, has come to an end. The officials and counsel of the company and of the Association of Bituminous Coal Operators on the one side and the officials and counsel of the United Mine Workers of America, District No. 2, on the other, have agreed as to all points of difference but one.

This relates to what constitutes "blasting coal out of the solid," as described in the mining code. County Judge Thomas F. Bailey will decide the question, the matter being left to him by mutual agreement. As a result of the agreement the mines resumed operation Dec. 4.

A strike of the union miners at Yatesboro and Nu Mine in Armstrong County, Pennsylvania, occurred recently, the object being to compel all the mine workers to join the union. Several came into the organization as a result of this action. The Graff Coal Co. in Blacklick township, Indiana County, Pennsylvania, has granted an increase of 18 per cent. to its miners. The mine is at the town of Blacklick, on the Conemaugh Division of the Pennsylvania R.R.

At the beginning of last month the Pittsburgh Coal Co. compelled the miners to use electric fuses in the Bridgeville mine, an operation in Allegheny County on the Pittsburgh, Cincinnati, Chicago & St. Louis Ry. These electric "red splitters" cost more money than the common squibs formerly used. Where the price of the squib was 15c. per hundred, the electric fuse costs $4 a hundred.

The miners claim that the cost of the fuse is so much greater than the cost of the squib that the recent rise in the scale is entirely wiped out. They also contend that the electric fuse is not any safer than the squib which has been tabooed, and they declare that they often have to use two or three fuses to one shot. Moreover, as all the shots must be fired by a shotfirer, the work of the miners is delayed by waiting for him. They urge that with more money expended on fuses and with the loss of output due to these delays the miner instead of receiving an increase of 5 per cent. in the present year is not able to make as much by 10 per cent. as under the old scale.

Difficulties in West Virginia

In West Virginia interest centers around the labor leaders who were recently sent to prison for a contempt of court which followed Judge A. T. Dayton's injunction issued September, 1913. The persons thus put in prison are Frank Ledvinka, James Otis, Hiram Stevens and Fannie Sellins.

President J. P. White, of the United Mine Workers of America, in his appeal to President Wilson declared that the defendants were convicted under a practice in contempt cases which is antiquated and without the benefit of a jury on a specific indictment.

It is urged that about half the sentence has already been served, that the sentence is unusually severe, and that despite the fact that the appellate court refused recognition on some parts of the injunction, the sentences were not reduced when the court resentenced the defendants on the counts remaining. White also states that the minds of the mine workers will be inflamed against their employers and against the courts of justice if the men are not pardoned, and that the jails of West Virginia are in an unsanitary condition.

The mine workers break the law and their minds are inflamed because the law is enforced. If that were an argument for leniency, then no laws would be operative. The capitalists do something in violation of the law and the minds of the people in Wall St. are inflamed, but at this the public is not particularly troubled. When the mine worker feels hurt at the administration of law the argument is different.

Law and justice are things with which mental inflammation have nothing to do. Perhaps the acts of Ledvinka and his associates should be forgiven, not because the mine workers threaten, but because, after all, conspiracies such as the defendants were engaged in are more or less technical crimes about which we cannot feel a great deal of indignation. Besides, it may well be true that the procedure was not so much antiquated as faulty.

Editorials

Increasing the Capital

All industries doubtless have their "ups and downs." With the coal-mining industry, so far as most of us can remember, it has been mostly "downs." At the present, however, it would almost appear that the "ups" are coming to bat.

Within the recent past it has been impressed upon *Coal Age* that capital is seeking investment in the industry. In the last two weeks *Coal Age* has learned of 63 companies which have been organized or reorganized with increased stock. The total authorized increased capitalization of these companies amounted to $14,917,000.

While it is quite probable that not more than half of this large sum has been actually "paid in," yet it is also equally probable that many companies have been given life of which *Coal Age* has not learned. It should also be remembered that this figure, which represents only one fortnight in the year, does not portray the aggregate pipe dream of financial inflationists. Rather it shows the actual capital estimated necessary to accomplish work and improvements already planned.

The organization of new companies and the reorganization of old ones with increased stock is going on now at a more rapid rate than ever before. The industry appears to be seeking capital, and capital is seeking investment in the industry. It would seem therefore that coal mining had at last crossed the Jordan of adversity and was entering the Promised Land of prosperity.

Is a Full Car Allotment Desirable?

To the coal men who are straining every resource at their command to obtain railroad equipment the above title may be viewed with derision. With free coal commanding such extraordinary figures, the operating interests are in a position to amass substantial fortunes in a comparatively short time, could they obtain adequate transportation facilities. But considered along broader lines, involving the best interests of the coal industry as a whole, there are some very convincing arguments why a full car supply may not be considered altogether desirable.

It is the opinion of the best thinkers in the coal industry today that some method of Government control, for the purpose of restricting the productive capacity of the country, is not only desirable but eminently necessary. It is a well-established fact that the productive capacity of the country is far in excess of the requirements, and the effects of the ruinous competition that characterize the dull, or even average, periods of the trade, are too well known to require comment.

Pending the development of some Government regulation on this matter, there is no doubt that this periodical restriction in the coal movement is a potent influence on the market. Certainly, the coal industry today would not be realizing an average price of $4.81@5.59 per ton as compared with $1.55@1.68 a year ago, as indicated by the table of comparative average prices in our market department, were all of the mines able to make full shipments. It is understood, of course, that a very small percentage of the tonnage moving commands these abnormal prices, but the influence these prices will have, and in fact are already having, on negotiations over future contracts, assures substantially better profits for the industry for some time to come.

It might be argued that this would be largely overcome by the storage of coal during the dull seasons of the year, though the coal men recognize that this is a good deal of a fallacy. A bulk commodity such as coal, of course, does not lend itself readily to storage; where, for instance, would it be possible to store say even a three-months' supply, representing more than 125,000,000 tons? It is a well-known fact that the big contracts on which storage is obviously impossible set the pace for the general market. Thus signs of the present boom were cropping up as early as last August when the bids for the big Panama R.R. contract, involving half a million tons, were made known.

Individually, it will be difficult to appreciate the benefits of inadequate transportation facilities, but collectively, it would almost appear that a kind providence is intervening in behalf of the industry as a whole.

It Often Takes Two To Make an Accident

The address of Joseph Knapper at the Coal Mining Institute of America, published elsewhere in this issue, extends somewhat the line of thought so well outlined by Prof. F. W. Sperr at the National Safety Council meeting in Detroit, an abstract of whose remarks appeared in *Coal Age*, Nov. 4. It suggests that as it takes two to make a quarrel, just so it often takes two to make an accident.

When a bank is robbed by an employee or a burglar, the manager does not attempt to excuse himself by saying that the man should have been honest. He realizes that he should have put up such precautions against robbery as would have been reasonably calculated to prevent the theft. If he has done this, he is exonerated; if not, everyone remarks that he was a negligent manager.

Similarly, when a mine is blown up, it is not enough to say that the man who set fire to the gas had been warned of its presence, or should have heeded the indications in his lamp, or seen the notice at the mouth of his room. It is as necessary to make sure in some positive way against a crime of negligence in this case as it is to assure ourselves in a positive way against a crime of dishonesty in the other. Still more is it necessary to guard against oversight and moments of absentmindedness.

The bolting and barring of entrances to dangerous places in the mine, advocated by Knapper in his address, might on certain occasions prove a source of peril, as in a squeeze, or when men are trying to escape after an explo-

sion. Consideration should, of course, be given to this problem, but it would appear possible to extend the provision of safety by the use of suitable gates in well chosen places.

Inspector Knapper does not go deeply into details, and it is not necessary that he should. The important matter is that we should arrive at the point at which we are willing to admit that, though any given accident was caused directly by the negligence or oversight of the man himself, or of his fellows, there is also a possibility that it might have been avoided completely had certain precautions been taken by those who were actively in charge of the operation.

The operator is no longer financially on the defensive. He has to pay the bill anyway. Let him look at the problem not as a defendant, but as a disinterested person; or even, rather, as one anxious to see his own failings in the premises. It is almost useless to blame others. They may be far more chargeable with the accident, but urging them to avoid unsafe practices will not do much good; in fact, not one-half as much as can be done by the employer if he will only search out his own responsibility in the matter.

Let us repeat: There are usually two in an accident and two in a quarrel. It might be well were the employer to keep that in mind. The man who is not quarrelsome usually finds he can go his way in peace, and the man who makes all the provision for safety open to him will find that most of the provisions have been covered and accidents will be less numerous.

"My mine is safe," the operator says, "if only some idiot doesn't do some thoughtless act or some criminally careless fellow doesn't break the law. I cannot guard against these possibilities," The kernel of Knapper's address is the suggestion that perhaps he can and ought to guard against some of these risks.

A cow caused the conflagration that burned down Chicago, the swish of her tail upsetting a lamp. Some would think that cows should be admonished and anathematized. The insurance companies thought differently. As a result Chicago, when rebuilt, was not burned again, though cows continued to swish their tails and will swish them as long as cows are cows.

An adequate measure of precaution was adopted by those who alone could be induced to follow the dictates of reason. It is a waste of time to abuse cows; it is equally an abuse of rhetorical genius to berate the criminally careless. The problem is, What are *we* going to do about it? As Benjamin Franklin said, "If you would have a thing done, do it yourself."

Terre Haute in Coal Business

Terre Haute's venture into the retail coal business as a municipal affair is apparently attracting the attention of the entire country, for since Mayor James Gossom started his movement he has received letters from people in many different towns asking for prices on fuel. The greatest surprise of all was a long-distance telephone call from Milwaukee, Wis., from a man who wished to buy coal.

Mayor Gossom is following out the precedent set several years ago when Mayor Lew Shank, of Indianapolis, Ind., fought the increased cost of living by selling potatoes. Before opening up the municipal coal bin the Terre Haute executive first took steps to learn if the city had such authority and was assured by state officials that such action was wholly within the jurisdiction of the municipality.

Soon after this he obtained the output of the Gregory mine, a small wagon plant, not served by a railroad, a short distance from the city. Orders began to pour in and the city controller was soon swamped and even now has enough orders to last for several weeks. The plan being followed out by Mayor Gossom is to sell the coal through the office of the city controller and on a strictly cash basis.

At present the city is underselling many of the retail coal dealers, who are asking as much as $5 a ton for fuel. Within a short time, when the municipal venture is running more smoothly, Mayor Gossom expects to have the price down to $2.50 a ton.

The idea has taken such a strong hold upon some of the residents of Terre Haute that they are fostering a movement for a municipal mine, and the commissioners of Vigo County are considering such a plan for the furnishing of coal to the county institutions. The city school system is not in need of coal, having contracted in August for its winter coal supply.

It might be a good thing if many cities started coal mines of their own. They would be the first to advocate that prices be kept at a safe and adequate figure. They could not sell coal at a loss for nine months in the expectation of recouping their losses by high prices in the fall or just previous to a strike. They would always be calling for coöperation, and if they did not get it, the bankruptcy of the mine and municipality would be an object lesson to mankind well worth the expense.

Such attempts would stave off rather than hasten a movement toward national ownership of utilities. This latter is the real danger to be avoided, for if every mine were managed by the Government, who would be able to say whether this cause or that was the reason for the failure to produce coal cheaply? If prices rose, we should hear that it was because the mines were better maintained or the miners were better paid or more generously handled.

Partial nationalization such as Terre Haute proposes will provide the new system with a number of handy yardsticks whereby its success can be measured, and there will be a number of interested parties who will see that the new venture is well and truly measured.

Increased Wages

During the past two years many coal companies have periodically increased wages. Three times within the past twelve months the Tennessee Coal and Iron Co. has made such increases. Other firms in the Birmingham district have done likewise, until it is estimated that the increase in this district alone amounts to half a million dollars per month. The Birmingham district is by no means the only one that has voluntarily increased wages. Other fields as well have made wage increases from time to time. It would be difficult or impossible to estimate the total amount of these increases, but it is probable that the aggregate amount runs well into the millions monthly. There can be no mistaking the significance of these higher wages—the coal industry is prospering.

Department of Human Interest

Coleman Mine-Rescue Contest*

By W. A. Davidson†

A contest in first-aid and mine-rescue work was held in Coleman, July 1, 1916, under the direction of the Rocky Mountain Branch of the Canadian Mining Institute. This was the first competition of the kind held in the Dominion and it is hoped that others will follow. There was one full-team event in first-aid and one in mine-rescue work.

In the mine-rescue contest, teams were entered from Fernie, Michel, Coleman, Carbondale and Lethbridge. A mine was improvised in the field, and it was assumed that an explosion had occurred, wrecking the workings to some extent and deranging the ventilation; and that, in addition, a workman had been overcome with gas at the face of one of the rooms up the pitch. Each team was required to rescue the unconscious man and resuscitate him by means of artificial respiration and the use of the Pulmotor and Lungmotor; also to restore ventilation by rebuilding blown-out stoppings.

The judges in the competition were: Thomas Williams, inspector of mines, Fernie, B. C.; Dudley Michel, Department of Mines, Victoria, B. C.; Charles O'Brien, Superintendent of Mines Rescue Station, Fernie, B. C.; William Shaw, district inspector of mines, Blairmore, Alta.; W. B. Powell, Superintendent Mine Rescue Car No. 1, Canmore, Alta.; Duncan McDonald, superintendent mine-rescue station, Lethbridge.

The winners and prizes in this event were: 1. Fernie (Coal Creek), shield and five gold medals. 2. Lethbridge, No. 6, five watch fobs (each made from a $5 gold piece). 3. Lethbridge No. 3, five silver medals.

In the first-aid contest there were seven teams entered: Coleman, No. 1 and No. 2; Michel, Carbondale, Lethbridge and Coal Creek No. 1 and No. 2. This event consisted of three parts; namely, the question, individual and stretcher tests, each team being required to take part in them all. This proved interesting to the spectators, as there were always three teams working at the same time.

The judges in the first-aid contest worked in pairs and were Dr. Oliver and Nurse Dempster; Dr. Ross and Corporal Johnston; Corporal White and Mr. Nasmith.

The winners and prizes in this event were: 1. Coleman No. 1, shield and five gold medals. 2. Carbondale, five watch fobs (each made from a $5 gold piece). 3. Coleman No. 2, five silver medals.

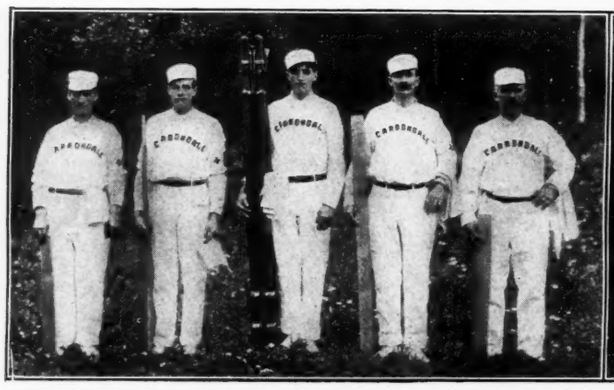
The two shields, five gold medals and ten silver medals were donated by the Rocky Mountain Branch of the Canadian Mining Institute. Five gold medals were donated by W. R. Wilson, chairman of the branch. Ten gold watch fobs, comprising the second prize in each event, were donated by District No. 18, United Mine Workers of America.

The deep interest taken in this contest was clearly shown by the large number present. Special trains were run from Lethbridge and Fernie. The care of the visitors was placed in the hands of the local Red Cross, the ladies on behalf of that organization selling refreshments and badges in specially erected booths. The Town Council conducted the field sports, which consisted of the usual events, with cash prizes. The Coleman Band was in attendance during the entire day. The contest was such a complete success that the Institute has decided to make it an annual event.

WINNERS OF FIRST PRIZE, FIRST-AID CONTEST

In the first-aid contest a great difference was easily apparent between the work of the three winning teams, all from Coleman, and that done by the four other organizations. The relative value of the training easily accounted for this difference. Coleman was one of the first of the mining towns to organize a branch of the St. John Ambulance Association, November, 1910, and the first classes were started in January, 1911. Since that date, there has been a class each winter, with the result that a large number of first-aid certificates have been granted. As the classes advanced several members have obtained the "medallion," a number even going as far as to secure two and three "bars."

Special mention must be made of Coleman Team No. 2. This corps consisted entirely of Slavonians. They won only the third prize, but there is little question that they would have carried off the shield if they had had the same command of English as the other teams. Their field work was excellent. Mr. Chalmers, superintendent of the washhouse, himself an old and tried St. John ambulance man, should receive much credit for the high-class work of the Coleman teams.



WINNERS OF SECOND PRIZE, FIRST-AID CONTEST

WINNERS OF THIRD PRIZE, FIRST-AID CONTEST

*Coleman, Alta., is in the Crow's Nest Pass district, between Crow's Nest and Frank in McLeod County, near the British Columbia line.

†Institute of Technology and Art, Calgary, Alta., Canada.

Discussion by Readers

Bonus System in Mining

Letter No. 4—Kindly permit me to refer to the statement of William W. Miller regarding the bonus system in union mines, *Coal Age,* Nov. 11, p. 815, where he says, "My experience teaches me that the bonus system cannot be applied to mines operated under union contracts."

For a number of years I have been a union miner, and only once during that time have I had the opportunity of working under the bonus system. That occurred a few years ago, in the development of a mine where I was employed. The mine officials were all shrewd mining men, and it was commonly agreed to employ only the best men in their mines. They made every endeavor to secure men having a good reputation as capable miners. Special pains were taken to secure competent firebosses and capable motormen and tracklayers. Men of this class who were competent were paid the regular wage scale, $2.84 a day and, in addition, received a bonus of 16c., making their daily wage $3 for eight hours' work.

It must be admitted that good results were obtained in this system, for a considerable time. Some difficulty arose, however, when there was a scarcity of good motormen in the district, and one of the regular bonus men quit his place. It was necessary to give a new man a trial, and he naturally expected to receive the same bonus as the man whose place he filled. Indeed, it may be said that had this been denied him he would not have shown the same results. Thus, to avoid any friction, the new man was paid the same bonus as the old and tried men.

The Practical Working of the System

Later, a new wage scale came into effect, making the pay for all inside day labor $2.98, which was agreed to by the operators and mine officials of that district. In the mine to which I have referred, however, it was then announced that the bonus previously paid would be withdrawn, owing to the advance in the wage scale. The sequel proved the truth of Mr. Miller's statement that "the slightest precedent established at any one mine in a district will be fixed on that mine in the next agreement with the union." It was found that the men would not consent to the withdrawal of the bonus, and the company was obliged finally to continue the payment of the same, after the wage scale had been raised. But, when a new man was employed to run a motor or to lay track or do other work in the mines, they were only paid the regular wage scale.

I quite agree with W. H. Noone, whose letter appears on the same page of *Coal Age,* and who argues that the application of the bonus system wherever possible greatly increases the efficiency of the employees. But I believe that the adoption of the system by a union mine will only result in loss to the company, because the same bonus must be paid to all employees alike, whether or not they are equally competent and efficient.

In closing let me suggest that if, in the agreement between the operators and the miners' officials, the wage scale was fixed so that it would apply with equal fairness to different classes of work, according to their value and importance, it might be possible to obtain equally as good results thereby as by the use of the bonus system, which might become a thing of the past except in special cases where a company was particularly anxious to retain a good man on important work. Let me ask if there is anything fair in rating a competent fireboss or electrician with a driver or dayman working on slate. In my opinion a revision in the day-wage scale would benefit all parties concerned.

FIREBOSS.

Poston, Ohio.

Letter No. 5—Having been employed in a mine at one time where the bonus system was used, I want to say that I fully agree with W. H. Noone in his claim that the system can be adapted to meet the special requirements in coal mining, as expressed in his letter, *Coal Age,* Nov. 11, p. 815.

In the mine to which I have referred the coal was gathered by mules and hauled from the inside parting to the tipple by a system of rope haulage. The inside drivers requested an advance in wages, which was refused them by the management. This refusal, however, was accompanied by an offer of the company to pay a bonus for all coal hauled above a certain average. In other words, the men were to be paid a certain minimum wage and, in addition, a bonus for every ton of coal in excess of a stated daily average output.

To this the men agreed, and the result was that the output of the mine was largely increased, as were also the wages of the men, to the extent of from 10 to 15 per cent. Both the company and its employees, therefore, profited by this arrangement.

In my opinion it is a good business policy to pay a man for all the work he can perform, whenever and wherever it is practicable to do so, on a contract basis. Today, the tendency in all mills and factories is toward piecework, which is equivalent to contract work in the mines. The adoption of such a system puts the question of a man's earning power up to himself and to an extent, reduces the cost of supervision.

If this is a good policy in other industries, I want to ask why it will not prove to be the same in coal mining. It is evident that in the mines every opportunity is accorded the men to shirk their work, by reason of the darkness and isolation of the men who cannot be watched all the time. For this reason, the adoption of paying for work by contract whenever possible is more urgent in mining than in any other industry. There are, or course, kinds of work that cannot be put on a contract basis, and it would be difficult to apply a bonus system to such work.

Mr. Noone states a truth when he says, "Time and material are the two great sources of cost in any scheme, and the waste of either of these is an enormous item in

the success of the operation." All will agree that if it were possible to so perfect the operations of a mine that all the employees would use time and material as though it were their own, the cost of mining would undoubtedly be greatly reduced. U. S. WILSON.

Briceville, Tenn.

Working and Bossing

Letter No. 1—While it is quite evident that all men are not born to command, it is nevertheless true that many of those whose duty it is to receive and obey orders are often in a position to give valuable advice, if permitted to speak or asked for their opinion. The information that the man on the job could often give the fellow higher up, is frequently of a nature to make the latter sit up and listen. But, not being asked, a subordinate does not ordinarily offer his advice, which he naturally feels would not be accepted. It is only when the safety of the mines and that of the lives of the men in his charge are in danger that the underground officials are heard from, and these occasions are rare.

A case of minor importance but, nevertheless, bearing directly on the cost-sheet of the company, occurred in our district some time since that will serve to illustrate what I have just said. The manager of a large coal company decided to try out a new kind of grease on its mine cars and sent a supply of the lubricant to one of their mines, but neglected to inform either the mine superintendent or the foreman of its purpose. Six months later the superintendent received a letter from the main office requesting an immediate reply with reference to the quality and the satisfaction given by the last shipment of car grease sent to the mines. It so happened that the superintendent and the foreman at this mine maintained a somewhat distant relationship to each other. The foreman rarely approached the superintendent except on matters of the utmost importance and the superintendent, likewise, was seldom known to ask his foreman for any advice or suggestions.

THE SUPERINTENDENT'S MISTAKE

In reply to the manager's letter, the superintendent wrote that he had heard no complaint and thought that the grease was "O.K." He explained that he had been exceptionally busy on outside construction work that required his attention for some time back and had not been below as much as usual during the past few months. What a different story the mine foreman could have told had he been asked in regard to this same car grease, which had caused no end of trouble and annoyance underground. In the words of the drivers and the men who handled the cars, "They were so stiff that they would not fall down the shaft."

This is but one of a thousand similar instances that show mismanagement. The natural trait of many competent superintendents and mine foremen is optimism; but, slowly and surely, not a few of these are being turned from the path of cheerfulness into the dull, bleak road of pessimism, by the autocratic bearing of those to whom they have a right to look for kind and humane treatment. The man on the job is too seldom consulted, except to know the reason for the falling off in the output; and if the cause involves a little expenditure to correct the trouble, the matter is apt to receive but slight attention from the management.

Most under mine officials are very human, and kind treatment will go far toward cutting down costs in the mines and increasing the showing on the balance sheet at the end of the year. A feature of coal mining that is often overlooked by captains of industry who have been successful in other ventures and who attempt to run a coal mine on the same general plan that they would adopt in the operation of a machine shop or foundry, is the peculiar conditions that surround the men underground, who work in isolated groups and are largely dependent on their individual judgment.

The management of a coal mine frequently fails to realize that the individuality of every underground official is a large factor in the successful operation of the mine and the lowering of the cost of production. To the man who knows, it goes without saying that there must be complete harmony and coöperation on the part of every one concerned, from the president down to the trapper boy; and this coöperation calls for the free exercise of the individuality of every man on the job, whose judgment and experience are at least worthy of consideration by the men higher up. WILLIAM CROOKS.

Kimberly, Ala.

Letter No. 2—The statement in the Foreword of *Coal Age*, July 15, to the effect that "most of us who work for the other fellow, whether we like it or not, find ourselves bossed," sets me to thinking.

It is human nature not to want to be bossed or controlled. There are even those who regard labor as degrading and who cannot understand that honest work makes men healthier and happier; and, as a rule, one who works daily lives longer than one who passes his days in ease and idleness. Wealth and idleness cannot bring happiness, which only comes as the result of contentment with one's lot or condition.

But, to return to the question of the true relation of working and bossing, it must be granted that labor is essential to living. The producer sells or exchanges his product for the necessities of life. But the majority of people have only their labor to sell or exchange for what they need and, therefore, they must work for the other fellow and be bossed.

In the great industries labor works for capital. Large enterprises cannot be operated by individuals—one man cannot operate a coal mine, neither can 100 men act as bosses. The hundred or more workers require a leader, or boss, to direct and control their efforts, so that they will all tend toward the accomplishment of the same end. It is evident that someone must do the work and someone the bossing.

BOSSING NOT AN EASY OR AGREEABLE TASK

Experience proves that few men possess the qualifications that render them capable of directing the work of others successfully. To work one's self is quite different from directing another how to work. Few understand that it is a more difficult and disagreeable task to direct the work of a large body of men than it is to perform the work that falls to the lot of the individual who is a part of that body. The worker has none of the responsibilities of the boss. It is natural for him, however, to feel that he has the harder work to perform, until he has had some actual experience; and then he is generally ready to change his mind.

It takes a big man to make a capable and successful boss. He must possess personal power and the magnetism that will attract men to him and give them confidence in what he says and does.

The faithful and competent worker becomes largely his own boss. For example, the miner who digs coal and is paid by the ton is practically his own boss if he is industrious and careful in the performance of his work. Such a man thinks or cares little for the fact that he is bossed in a reasonable way. It is the careless and indifferent worker who objects most frequently to being bossed, and it is men of that class who are least fitted to boss others. An old maxim says, "The man who cannot control himself can never expect to control others."

Dayton, Tenn. JOHN ROSE.

An Efficient Coal Miner

Letter No. 9—Few words are necessary to describe what I believe makes an efficient coal miner. He is a fellow who knows his work and does it in a way that is both economical for himself and for the operator.

A miner who fails to examine his working place often, and especially before starting to work in the morning; or fails to timber his place in a proper manner; or to shoot and load his coal in good condition for the market; or to comply with the terms of his contract; or to order timber and other material when it is needed in his place; or to draw the foreman's attention to inadequate air in his place or other dangers that have been overlooked, is certainly not to be classed as an "efficient coal miner."

The miner who fails in any of the respects I have just mentioned will ultimately become a costly asset for the operator who employs him. I regret to say that many mine bosses do not appear to realize the extra expense and the increased danger of employing such men. But the trouble is not always with the miner. Could many foremen realize the results of their own failings when needed material is not promptly furnished to the miner, they would see that it was a false economy on their part to delay supplying the material needed by each man as it is ordered.

A little of my own experience along this line will serve to illustrate my meaning. I have been working two rooms, one of which will have cost the operator about 100 per cent. more for timber than it should, simply because the timbers needed were not sent in promptly as ordered. In consequence, in order to hold the place open, it was necessary to use double the amount of timber. I even had to suggest that it might become necessary to refer the matter to the mine inspector, as the place was getting unsafe for work. This suggestion, however, brought the necessary timbers, although it caused some unpleasantness at the same time. A MINER.

Linton, Ind.

Shortage of Labor in Mining

Letter No. 13—The question uppermost in the minds of many operators is, How can we secure the men necessary to increase our output of coal and meet the demands of the market? Agents are abroad offering all sorts of bonuses to place their orders, and all officials are vying with one another in their efforts to obtain men for operating their mines to the fullest capacity. Many resort to methods that, in the end, do not help themselves but hurt others, inasmuch as they tend to produce a larger proportion of the floating element among mine workers. These methods tend to make the men more independent and difficult to handle.

A little reflection will convince anyone that there is a practically fixed number of available miners in this country at the present time and agents put on the road cannot increase this number, while their efforts tend, as I have said, to dissatisfy the men with their present employment and render the situation far worse than before.

Recognizing these conditions, would it not be better to take every labor agent off the road and resolve, by fair treatment and humane methods, to retain the men already in the mine and, further, consider how these can be used to the best advantage, by the adoption of labor-saving equipment and the most improved methods of working, while insisting on a fair day's work for a fair day's pay.

In looking for ways of increasing the output of a mine, the coal operator must study closely the many mechanical improvements that have been made in mine equipment. I believe that the output of the average coal mine can be increased one-third by the judicial application of some of these means at hand. One can find men operating hand-pumps and baling water into water cars, without a thought that this work can be performed more economically by tapping the power lines already installed in the mine and using this power to operate a small pump. In many cases, the simple laying of a siphon may accomplish the same purpose and save the expense of hand labor.

MANY EVIDENCES OF MISMANAGEMENT

Again, there are mines employing from 10 to 20 drivers and as many mules and hauling the coal long distances to the bottom of the shaft or slope or to the tipple. In other instances the operator has never seriously considered installing a more uptodate and efficient means of haulage in the mine. He either does not know or doubts the fact that one-half as many motors as the mules he now employs would about double the output of his coal at a less cost per ton-mile for hauling.

In the same manner, men are found mining the coal with a pick, under conditions that would render the use of coal cutters of great advantage in reducing the cost of production. The introduction of machines for cutting and loading the coal at the working face, under favorable conditions, has rendered the use of the pick and shovel in mining as obsolete as are the old grain cradle or scythe for mowing in farming today. Where machines are in use in the mine, we often find them hauled from room to room by a mule, when a simple bonding of the rails would permit the machines to be self-propelling. The labor and expense required for loading the coal at the tipple can often be reduced by means that render this work less laborious.

The practical mining man must admit that this present time should be an epoch-making period in the coal industry. "Necessity is the mother of invention," and the scarcity of labor today should give an impetus to the installation of such mining equipment as will enable the mine to be operated with a smaller number of men.

The catalogs of manufacturers and the advertising pages of coal-mining papers, show a large variety of such equipment, and these should be studied by coal operators to ascertain their particular adaptation and fitness to the

conditions in their mines. The call, today, is for the use of more brains and less brawn, by the practical application of the principles of mechanics in the displacement of muscle. Let coal operators awake to this fact.

Masontown, Penn. J. O. DURKEE.

Letter No. 14—In his letter on the "Shortage of Labor in Mining," *Coal Age,* Nov. 4, p. 771, Samuel Jones deplores the fact that men are scarce in the mines and suggests that everywhere the question is being asked, "What has become of the laboring classess?" Then, on the same page, Gaston Libiez follows with a letter in which he chants a different refrain and asks, "What does all this cry of scarcity of labor mean, when there are so many workers idle?"

Granting that both of these conditions exist in the coal mines today—a shortage of labor in one section and a scarcity of work in another—it must appear to even a casual reader that there is something wrong in one or both of these sections. Allow me to suggest that that "something" is a factor that has not as yet been considered seriously in connection with industry in the United States and is expressed by the single word "employment."

DIFFICULT PROBLEM AWAITING SOLUTION

The employment of men, together with its counterpart, unemployment, presents a problem not easy of solution and one with which political economists and legislators have long grappled, with but limited success. That the coal industry has more than once been confronted with this problem is evidenced by the several letters submitted in the recent contest in *Coal Age,* Sept. 23, pp. 505-507, for the improvement of the coal industry. Among the suggestions made at that time was the establishment of labor bureaus, or exchanges, having for their object the bringing together of the man and the job.

At the present time many industries in this country are working at high tension, in order to supply the extraordinary demand for war munitions in Europe, and the popular belief prevails that there is a job for every willing worker. While it is not easy to contradict this assertion, the fact still remains that there is a large proportion of unskilled labor out of employment—men who want to work and are able to work, but whose efforts to secure employment have been unavailing.

UNEMPLOYMENT STATISTICS LACKING

For some reason best known to itself, the Government has not given great publicity to the statistics of the unemployed collected in the census of 1910. However, the latest available reports of the United States Geological Survey, covering the period of 1900-1910, show that the bituminous mine workers lost in those 10 years from 22 to 43 per cent. of their working time annually, while the same loss in the anthracite mines ranged from 23.7 to 50 per cent. annually. These figures do not include the year 1902, when the great anthracite strike took place.

Of the many reasons suggested for the unemployment of labor, economists have pointed out what they consider are the two chief contributory factors; namely, the inequality in the distribution of wealth and the denial of access to the lands and natural resources owned by the Government and at present unoccupied and unproductive. Other causes worthy of mention are the following: Unrestricted immigration, the seasonal character of many industries, the long workday that invites overproduction and a poorly organized labor market.

In connection with the overproduction resulting from a long workday, John P. White, international president of the United Mine Workers, recently claimed that "the miners could dig all the coal the country needed in a 4-hr. day," as reported in *Coal Age,* Oct. 28, p. 720.

Although it may be impossible to correctly analyze the effect of these several causes to deny work to willing hands, two facts stand out prominently in the present situation: (1) The employment problem is a vital one and requires immediate remedial measures and (2) the fluctuation of immigration, coupled with an even greater fluctuation in the demand for labor—ranging from the present activities in almost every industry, caused by the world war, to a probable stagnation of work when the war shall close.

FLEXIBILITY NEEDED IN LABOR SITUATION

The latter of these two conditions calls for a certain flexibility and the efficient organization of the labor market, which, at the present time, is not characteristic of the United States. The problem of taking care of the unemployed has been carefully considered in many countries, particularly Germany and Great Britain. In Germany these efforts have proved eminently successful until negatived by the present war. It is doubtful, however, whether the plans adopted in these countries would be of any avail in the United States, owing to the great volume of immigration to our shores in normal times.

In the opinion of many, a large measure of practical relief could be attained by the restriction of immigration.

This, together with the development of the policy of throwing open larger tracts of undeveloped land under new homestead laws, adapted to the conditions and designed to suppress undesirable privileges, would, it is thought, go far toward creating a job for every man and a man for every job. ALEX MOSCOVITZ.

Letter No. 15—I agree with the idea that has been expressed by some writers that the scarcity of labor in many mines can often be explained by the unfair treatment given the men by foremen, in respect to paying them different rates for the same kind of work performed. While many men are driven away from a mine by a crusty foreman, who only has himself to blame for not being able to hold his men, I think the chief cause of men leaving a good mine is the different rate paid men for doing the same work.

In some instances I have known the foreman to pay one man a contract price for loading entry coal, while he paid other men only a machine price for the same class of work. Anyone will agree that this is not a square deal, and it is no wonder that men so treated leave the mine and seek work in the shops and mills, where they know men are paid alike for the same class of work.

In my opinion miners are as stable as any other class of workmen, but, because of the different kinds of work performed in the mine, it often happens that men are not paid on an equal basis. In a few cases the mine foreman may try to make good his own record at the expense of one or more of his men. When this is discovered, the men naturally decide to move into other fields or seek new pastures where they hope for better treatment.

Johnstown, Penn. FRANK WENTZ.

Certification of Mine Foremen

Letter No. 12—In regard to the certification of mine foremen, allow me to say that this is an age of specialists. There is probably no industry in which both theoretical and practical knowledge are of greater importance than in that of coal mining. That experience is a good teacher, has never been disputed. Successful men in all industries are those who profit, not only by their own experience, but also by that of others.

No one man has the ability, time or means at his disposal to successfully master all the details of operation in the industry in which he is engaged. However, by careful study and application, every man can learn much from the experience of those who have a broader knowledge of the theory and principles of their calling. Much is to be gained by reading good reliable books and periodicals written by men who have made a special study of a particular branch of an industry.

In coal mining there are men who have become experts in the principles of ventilation, others in drainage, and still others in haulage or methods of working. These men are not generally men of one idea, but rather they are broadminded and have much practical experience that renders their opinions worthy of careful study by men of less education and who are ambitious to fit themselves for higher positions in their calling.

It is true that there are many who set themselves up as authorities in some special line, who have neither the learning nor the experience that would warrant them in so doing. The writings of these men often prove misleading and dangerous to the students. For this reason, the question of getting the best information on any given subject is an important one. To discriminate between right and wrong principles requires careful study on the part of every ambitious student, who must read the most reliable books and papers published.

Many an intelligent and ambitious miner has spent almost a lifetime in educating himself so that he may be able to pass the examination that is required by law in most of the coal-mining states. Few men realize what a great disappointment and injustice the recent enactment by the Legislature of Pennsylvania has proved to be to this class of its citizens.

Effect of the Pennsylvania Law

When the law permitting mine operators to employ uncertified men as mine foremen went into effect last January, in the State of Pennsylvania, it robbed a large number of intelligent miners of their lawful rights. The law still requires, or shall I say permits, the examination of candidates for the positions of mine foreman, assistant foreman and fireboss, and grants to successful candidates a certificate of competency, certifying that they are capable of filling these positions. In each case the certificates have been bought at a great sacrifice of the candidate's time and labor, and at an expenditure of his limited means that he could ill afford but for the protection that he had a right to expect would be accorded him under the old law; namely, that he and those of his class would be guarded in their rights as holders of certificates granted by the state.

The difficulties encountered in mining coal and the requirements of the coal market are becoming more burdensome every year, and the modern colliery requires men of more than ordinary ability and intelligence. Why then, may I ask, should the employment of uncertified men be legalized? In the interest of safety, if for no other reason, men having the care and direction of mining operations should all be holders of certificates of competency, which should be the evidence that they have fitted themselves by study and experience for holding the position in which hundreds of lives are daily entrusted to their care. I want to ask, Has the certificate of competency granted by the State of Pennsylvania any value whatever under the new law? It is my strong hope and that of many others that this law will be wiped from the statute books by the coming Legislature.

Plymouth, Penn. Fred B. Hicks.

Letter No. 13—Kindly permit me to add a few words in reply to Samuel Dean's criticism of my previous letter, *Coal Age*, Nov. 11, p. 817, as I still claim that the reduction in the fatality rate in Colorado, per thousand men employed in the mines, is solely due to the operation of the law of 1913, requiring the certification of underground mine officials.

In my previous letter I contrasted this requirement of the Colorado law with that of the new law in Pennsylvania permitting the employment of uncertified men as mine foremen. The clause of my letter to which Mr. Dean refers does not relate to certified mine foremen alone, but to all certified mine officials, including state mine inspectors and deputies, mine foremen, assistant foremen, firebosses, shotfirers and company mine examiners, all of whom must hold a certificate of competency under the new law.

Certification Law in Colorado

Mine officials of every class, mine inspectors and general managers, have labored faithfully and earnestly for the enactment of this law, to the end that there might be no recurrence of the Primero, Starkville and Delagua disasters of 1910, which horrified the people not only in Colorado but throughout the country. These three explosions, occurring within a period of less than 10 months, caused the sacrifice of 210 lives.

In the 28 years previous to the passage of the new law in Colorado, 1886-1913, the yearly death toll in the mines of this state averaged 62 men out of 8,603 employed underground, making a death rate of 7.2 per thousand men employed. In the two years following the passage of the law requiring certification of underground officials in Colorado, there were 138 men killed out of 11,330 employed underground, or an average of 69 men per year, making the death rate for this two-year period 6.1 per thousand men employed.

My conclusion is that all mine officials, from mine inspectors to firebosses, are fulfilling their duties in our mines better than ever before. I claim this is because they know their duties better under the new law and their compliance is urged by the penalties prescribed for its violation by any negligence on their part. Prior to Jan. 1, 1914, when the new law went into effect in this state, the mine inspector could not remove a mine foreman or fireboss for neglect of duty or incompetency. Under the new law, any certificate may be revoked for a failure to perform and carry out the duties required by the act. I believe that the stringency of this law is gradually decreasing the fatality rate in this state.

Walsenburg, Colo. Robert A. Marshall.

Inquiries of General Interest

Duties of Mine Examiners

For the information of myself and others, I would like to ask for an expression of opinion by *Coal Age* and its readers, in regard to the duties of mine examiners, under the coal-mining laws of Illinois.

Among the duties of certificated mine examiners, specified in section 21 of the state mining law, is the following:

> b. It shall be the duty of the mine examiner [fireboss]:
> 6. When working places are discovered in which there are recent falls or dangerous roof or dangerous obstructions, to place a conspicuous mark or sign thereat as notice to all men to keep out. . . .
> 8. To take into his possession the entrance checks of all men whose working places have been shown by his examination and record to be dangerous, and to give such entrance checks to the mine manager [mine foreman], before the men are permitted to enter the mine in the morning.

In some instances I have observed that the mine examiner would find a loose rock in a man's place and, having chalk-marked a cross upon it to indicate that it was dangerous, would take the man's check but fail to place, as required by the law, "a conspicuous mark or sign as notice to all men to keep out" of the place. When questioned later, he would claim that the place was not dangerous, and the man would be permitted to proceed to his work.

The question that has arisen is, Can a working place that contains a loose rock that has been marked by the examiner as dangerous be considered as being sufficiently safe for a miner to work therein, in the meaning of the law; and does the law require that a conspicuous mark or sign be placed at the entrance as notice to all men to keep out, when the only danger in the place is a loose rock that must be taken down or made safe? Does the law mean that the entire place must be dangerous for work, before the miner can be prevented from entering the place for work?

I would like to ask, further, Is the mine examiner complying with the requirements of the law when, after finding a loose rock and marking the same as dangerous, he takes up the entrance check of the miner but fails to place a conspicuous mark or sign at the entrance of the place as notice to all men to keep out, which would seem to be required by the reading of the law?

Catlin, Ill. ALEX PETTIGREW.

In the opinion of *Coal Age*, a working place in a mine is unsafe for work, and neither the miner nor any other person should be permitted to enter, if it has been found to contain any danger whatsoever, until that danger has been removed. We understand this to be the intention and meaning of the law to which our correspondent has referred.

In the instance cited we suppose that the mine examiner, after marking the rock as dangerous, took up the miner's entrance check as a further precaution to warn him to avoid the danger in his place, until the same could be removed. In doing this, however, we would suggest that the examiner is not complying with the law and assumes the full responsibility for any accident that may happen as a result of his failure to do what the law requires. We shall be glad to hear from any readers who may hold the same or another opinion of the meaning of this law.

A "Duplicate Survey"

Kindly permit me to ask what, in the opinion of *Coal Age*, is a "duplicate survey," in the meaning of the anthracite mine law, as expressed in art. 3, sec. 10 of the law of 1909, relating to the thickness of barrier pillars.

Pottsville, Penn. KERAN DONAHUE.

The article and section of the anthracite mine law referred to by this correspondent reads in part as follows:

> Such width of [barrier] pillar to be determined by the engineers of the adjoining property owners, together with the inspector of the district in which the mine is situated, and the surveys of the face of the workings along such pillar shall be made in duplicate and must practically agree.

The evident intention of this law is, first, to provide for a mutual agreement of the engineers of two adjoining coal properties in regard to the thickness of barrier pillar to be left between them, and which would be satisfactory to the mine inspector of the district, as giving a reasonable degree of safety in the emergencies that may arise in the mining of the coal underlying those properties. It further appears to be the intention of the law to provide for the accurate marking out of this barrier, so as to insure the full thickness agreed upon by the engineers and inspector. With this requirement in view, the law states that "The surveys . . . shall be made in duplicate and must practically agree."

In order to carry out the meaning or intention of the law with this understanding, the term "duplicate" must be interpreted as calling for two independent surveys made by separate engineers, starting from a common point of beginning and referred to a common meridian, or base line. These surveys should be made at different times, by different men, and should be wholly independent of each other, except with reference to the point of beginning and the meridian chosen. While it has been a frequent practice of some engineers in charge of the mine surveying to check up their own survey of a barrier pillar by starting a second survey from some point in the mine previously established, this cannot be characterized as a "duplicate survey" in the meaning of the law.

We would suggest that, if both properties are being operated at the time, the engineer of each property could extend his survey onto both sides of the proposed barrier independently of the other engineer. This plan would not necessitate bringing into the mine outside engineers, who are frequently unacquainted with actual mining conditions and requirements.

We shall be glad to have the opinions of mining engineers in the anthracite region and learn from them what is the general acceptation of the term "duplicate survey," as used in the anthracite mine law.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—How would you ascertain, as a mine inspector, that a hoisting plant was equipped and maintained as required by law?

Ans.—Assuming that the mine inspector has a thorough knowledge of the requirements of the mining law in this respect he should examine the hoisting apparatus in every detail, starting his examination by satisfying himself that the engineer in charge is competent to fulfill the duties required by the law. Being satisfied that the engineer is both capable and trustworthy, the inspector should proceed to examine the engine, winding drum, brakes and ropes, to see that they are in good condition. He should observe carefully while the engineer makes several hoists, paying particular attention to the signal system in use, the indicator and any other means of showing the position of the cage in the shaft. He should ascertain what means are used to prevent overwinding.

Having satisfied himself in regard to these points, he should proceed to the top of the shaft and examine the cage, safety catches and head sheaves. Then, stepping on the cage, he should order the engineer to lower slowly, giving him an opportunity to examine the condition of the shaft and guides from top to bottom. He should do the same when ascending on the other side of the shaft. He should examine the cagers at the upper landing and at the shaft bottom to see that they fully understand their duties and the requirements of the law in respect to the hoisting of men.

Ques.—Why is it safer to approach accumulations of water under high pressure than accumulations under low pressure?

Ans.—We cannot say that it is safer, except that the high pressure would cause the water to seep through the strata and make its presence known sooner than if the pressure was low. However, the danger would be correspondingly increased. This appears to be a catch question.

Ques.—What is the maximum pitch up which you would work breasts with roads, and what methods would you adopt in steeper pitches? Give a full description.

Ans.—Where the cars are to be handled by hand, the pitch should not exceed 6 deg. If the seam pitches more than this, it is possible to still handle the cars by hand in the rooms, by driving the latter across the pitch or at an angle with the full dip of the seam. Where the cars are lowered by means of a windlass the pitch may reach 10 deg. with safety. On pitches varying from 6 to 15 deg., self-acting inclines are used to advantage, the descending loaded car being made to pull up the empty, which partly balances the weight of the former. By the use of a barney weighing about half the sum of the empty and loaded cars, it is still possible to use the self-acting incline on pitches up to about 30 deg. In thick seams, what is called the "buggy system" is used on pitches varying from 10 to 18 deg. The refuse of the seam is there used to grade the road in sections, so as to make the fall about 5 or 6 deg. in each section. The loaded cars are dumped into empties at the end of each section. This system requires considerable rehandling and is not adapted to a soft friable coal. On pitches varying from 15 to 30 deg., the coal is sent down the breast in chutes. Where the coal will not slide easily on the natural rock surface, the chute is often lined with sheet iron.

Ques.—What are the advantages and disadvantages of using electricity for power or other purposes?

Ans.—An electric-power transmission can be quickly installed in a mine as the system is flexible, which adapts it particularly to mining conditions. The electricity can be used for lighting a mine as well as for haulage, coal cutting and drilling. The disadvantage of the system is the liability of contact of men and animals with live wires, the possible ignition of dust or gas or other combustible material, and the need of expert electrical attendance.

Ques.—How much greater load will a crossbar 8 in. wide by 12 in. in depth and 8 ft. long sustain than one of the same width and length and 10 in. in depth?

Ans.—Assuming that the bars are of the same material and the width and length are the same in each case, the strength of the beam or the load it will support will vary directly as the square of the depth. In other words, the load ratio is equal to the square of the depth ratio, which gives, in this case,

$$\frac{L_2}{L_1} = \left(\frac{d_2}{d_1}\right)^2 = \left(\frac{10}{8}\right)^2 = \left(\frac{5}{4}\right)^2 = \frac{25}{16}$$

That is to say, the beam 10 in. deep will support a load $^{25}/_{16}$ as great as the beam 8 in. deep. In other words, if the beam 8 in. deep will carry a load of 16 tons, a beam 10 in. deep of the same material, width and length will support 25 tons.

Ques.—With a water gage of 0.25 in., the velocity of an air current in a given airway is 200 ft. per min.; what water gage will be required to increase the velocity of this air current to 400 ft. per min.?

Ans.—For the same conditions in the mine, or airway, the unit pressure or water gage produced by a circulation varies as the square of the velocity of the air current. In other words, the water-gage ratio is equal to the square of the velocity ratio, which gives, in this case,

$$\frac{w.g.}{0.25} = \left(\frac{v_2}{v_1}\right)^2 = \left(\frac{400}{200}\right)^2 = 2^2 = 4$$

$$w.g. = 4 \times 0.25 = 1 \text{ in.}$$

Ques.—How would you proceed, with safety, to reenter a mine after an explosion that had destroyed the doors, brattices and overcasts?

Ans.—It will not be safe to enter such a mine without the use of breathing apparatus and safety lamps. As quickly as ventilation can be restored in the main entries, the work of repairing the doors, stoppings and overcasts destroyed by the blast should be commenced and pushed forward rapidly to reëstablish the circulation.

Coal and Coke News

Washington, D. C.

A complete report on the export trade situation has been published by the Federal Trade Commission in support of the so-called Webb bill, which is designed to permit domestic producers to combine in the foreign trade or establish joint selling agencies abroad without violating the anti-trust laws. This report selects several important industries, describes their present conditions and indicates how they could combine to compete with foreign combinations. Coal is one of the industries selected.

"Coal," says the report, "is one of the most promising commodities for the future development of a heavy export trade from the United States. This country has the greatest deposits of coal of any in the world. Its reserves are estimated to be greater than those of all other nations combined. It has an abundance of coal of especially fine quality for all uses to which this mineral is put, from household purposes to the most exacting metallurgical and steam demands. Immense producing fields are near enough Tidewater to facilitate export business. Suitable coal-handling equipment is already in use at many ports. The production of coal has been developed on a larger scale, with a greater use of mechanical equipment, and at a lower average cost per ton than in any of the important European coal-producing countries. In 1913, the last complete year prior to the war, the United States was credited with 39.5 per cent. of the world's output, while Great Britain contributed but 22 per cent. and Germany but 20 per cent. of the total.

"With these advantages in its favor, however, the United States was exporting much less than either Great Britain or Germany. In fact, British exports of coal were three and one-third times those of the United States.

"Of the total exports in 1913 from the United States, 19,689,066 short tons went by rail or inland waterways to Canada, a market in which little foreign competition is met, and 2,110,416 short tons were sent to Bermuda and the West Indies, also exclusively American markets. It is apparent, then, that of the small proportion of the coal output which is exported nearly 90 per cent. went into markets where it was practically without competition, and only about 10 per cent. entered competitive markets."

The report pointed out that the competitive foreign markets which promise most for the development of the coal export trade are South America and the Mediterranean countries. In both of these markets the chief competition has been British. Some German coal formerly went into South America and Italy, and after the war efforts, it is said, will presumably be made to revive this business, but the great bulk of the coal imported by all these countries has always been British.

Little Coal Furnished to South America

It is pointed out that prior to the present war the United States had but an insignificant share in the coal trade of these countries. The report thereupon proceeds to discuss the various export combinations of Germany, Belgium, France and Great Britain.

"There are three chief coal-producing regions in Germany," says the report, "namely, the Ruhr in the northwest, Upper Silesia in the southeast and the Saar in the southwest. The first district is the most important and is the only one that needs special consideration in this connection. It is the territory covered by the Rhenish-Westphalian Coal Syndicate. Although there are other coal combinations of some interest, the Rhenish-Westphalian cartel is the outstanding feature of the organization of the German coal-mining industry."

Belgium coal, it is said, does not compete to any important extent in export markets, but prior to the war the organization of the industry in that country was quite comprehensive. France also had its combinations. It is pointed out that before the war the Office de Statistique des Houilleres du Nord et du Pas-de-Calais controlled about 67 per cent. of the total production of the coal region. This organization is classed among the looser forms of cartel associations, as no central selling agency or bureau was maintained and the member companies were held together merely by price and other selling agreements, each company making its sales as it saw fit, within the limitations of the cartel. The prime endeavor of the organization was not to restrict output, but to find an outlet in more distant markets, foreign and domestic, for all excess production, so that the local or natural market might never be encumbered by an excessive supply.

The report then proceeds to a discussion of the large English production, stating:

"South Wales shipped 40 per cent. of all the coal exported from Great Britain in 1913, her exports totaling 34,000,000 tons, nearly all of which went out from the three ports of Cardiff, Newport and Swansea. Moreover, so far as American export coal trade is concerned, South Wales is much more important than Newcastle or other Eastern districts. The latter, shipping through the North Sea ports, export to the North European markets, in which American coals do not attempt to compete, but most of the English coal shipped to the Mediterranean and to South America comes from ports in the Bristol Channel.

"In 1913, 58 8 per cent. of the British coal exports to Mediterranean ports (exclusive of France and Spain) came from South Wales; 85.1 per cent. of the exports to Brazil, Argentina, Uruguay, Peru and Chile and 56.3 per cent. of those to France and Spain were from the same source. In 1913 the Bristol Channel ports exported 31,579,520 short tons, of which 11,718,560 went to the Mediterranean (excluding France and Spain), 6,584,480 to Brazil, Argentina, Uruguay, Chile and Peru, and 10,363,360 to France and Spain."

Proceeding to a discussion of the operations of the large British companies, the report said:

"In England as in America the trend of industrial development has been toward amalgamation and inter-relation rather than cartelization. The coal industry is no exception to the rule, and the interests in South Wales known as the Cambrian Combine, comprising inter-related operators, distributors, railways and ship lines, is a typical expression of this economic tendency in Great Britain. . . .

"Another large English firm of coal operators and traders is Cory Bros. & Co., Ltd., colliery owners, coal depot proprietors and coal exporters. The central offices of the firm are at Cardiff and London. Foreign offices and agents are maintained in Paris, Genoa, Cape Verde Islands, Buenos Aires, Rio de Janeiro, Pernambuco, Teneriffe and Las Palmas, Madeira, Bombay, Aden, Malta, Port Said, Algiers and Marseilles. The company owns and controls 16 collieries with a total annual output of 1,450,000 tons and sells coal from many other mines. It has coaling stations on every important shipping trade route throughout the world . . .

"Another factor of equal importance to British coal companies in foreign markets is their relation to business houses and coal-consuming industrial plants in those markets." The report mentioned the Wilson interests in Argentina as a typical case. It also directed special attention to the community of interest between coal production and the transportation services of England, including ship lines.

American Coal Can Compete

The Federal Trade Commission contends that American coal is of such high quality as to make it suitable for export. It declares that Pocahontas, New River, Tug River, Clinch Valley, Birmingham and central Pennsylvania coals, among others, are of sufficiently high quality and are accessible enough to Tidewater for the development of a good export trade. It also declared that Welsh coal at Tidewater docks normally is much higher in price than Appalachian coal at Atlantic and Gulf ports.

"Similarly," says the report, "the prices of central Pennsylvania coal at New York, Philadelphia and Baltimore and of Birmingham coal at Mobile and New Orleans are much below the prices on the Cardiff docks. With the development of coal shipments by the newly opened river route from the Alabama fields to Mobile the latter district may soon be offering export coal at prices decidedly below those now ruling at Atlantic ports for Virginia, West Virginia, Maryland and Pennsylvania coals."

It is contended, however, that the advantages of lower Tidewater prices and superior loading facilities have been nullified by the higher freights charged for transporting American coal to South America and the Mediterranean and by the British control of unloading and storage facilities in foreign ports. The lack of an American coal-carrying fleet, it is also said, has made American exporters dependent upon British vessels, and British ship brokers have been able constantly to maintain rates which favored the Welsh coal.

The report of the commission on coal concluded:

"Under the competitive conditions now existing in the coal trade the high quality of American coals, the unrivaled railroad and dock facilities in this country and the lower prices will plainly be of little or no avail in securing a share in the world's bunker and export trade unless American producers supply themselves with their own fleets of colliers and their own coal depots, unloading facilities, distributing yards, and agents in foreign markets. But to provide these and to undertake the work of advertising American coal abroad, of educating foreign consumers to the advantages of using it, of employing fuel engineers to teach them how to burn it, and of persuading them to alter their equipment to suit its characteristics, means a long and expensive effort. Obviously it can be begun only by a few of the larger American producing companies if they act as individuals, but if they coöperate for such business, scores of smaller producers may be able to share profitably in the upbuilding of an advantageous trade.

The activities of an association of coal operators in the bunkering trade at Hampton Roads have just been referred to, but an effort to adequately extend the American bunkering and export trade into foreign markets in competition with the English coal operators will require extensive coöperation. In the New River field, for example, there are about 60 concerns mining coal. Of this number, 10 of the largest produce approximately 75 per cent. of the total output, and one of these companies produces 25 per cent. It has been suggested that all the operators of this field who wish to take part in the bunker and export trade form a joint selling organization to handle the business, subject to such supervision by the Federal Government as the latter might deem expedient and desirable. It would have nothing to do with domestic business, which would be handled by the different companies individually, as is now done.

Such a joint selling agency, it is suggested, would fix the grades of coal which it desired to handle in foreign trade and would have a force of inspectors to see that each mine conformed to its requirements in this respect and to insure the necessary uniformity of quality to the foreign consumer. It would also establish coaling stations at important ports in South America and in the Mediterranean if that market were also cultivated, and would put on its own fleet of colliers. By these means large stores of coal could be maintained abroad where desired, the selling agency could keep in close touch with its customers and could guarantee regular and prompt deliveries of high-grade coal, and in quoting prices would be independent of the present unfavorable freights charged by foreign ship owners.

The problem of return cargoes for these vessels it has been suggested, could more and more be met by increasing shipments of South Aemrican raw materials, such as iron ore, copper and tin, rubber, coffee, hides, nitrates, quebracho, tropical woods, etc., and from the Mediterranean by cargoes of Spanish iron ore and copper concentrates, together with other European products that normally cross the Atlantic to our shores. From South America it might even be found advantageous to bring such vessels home via Europe, taking to that continent the South American grain and other foodstuffs and raw materials which are imported from the Latin-American countries in heavy volume.

The advantages claimed for such joint effort are manifold. Through such an organization the expenses of establishing a profitable coal trade abroad could be shared by many operators and would not be prohibitive to the smaller concerns. Steady and concerted effort would be applied to the development of business instead of the present intermittent attempts to obtain some foreign orders. Producers would be represented directly by their own salesmen instead of by the agents of foreign competitors of American operators, and foreign consumers would be able to deal directly with the sellers of their coal. The business would be independent of foreign ship owners and would be able to seek the markets that ought to be open to American coal. Similar organizations could be formed among the operators of other fields, so that every portion of the Appalachian coal-producing area which might export coal advantageously could be represented by an effective organization for foreign business.

As already pointed out, the development of the foreign business would benefit the industry by furnishing steadier operation of the mines and by partially equalizing the seasonal variations in demand."

Geological Survey Reports to Congress

The new regulations governing the classification and valuation of coal land have furnished a more rational basis for this work and has greatly facilitated it, according to the report made to Congress by George Otis Smith, director of the Geological Survey. "The regulations as they now stand," says Dr. Smith, "furnish what is believed to be a sound and reasonable standard for the classification and valuation of land underlain by coal of any quality or thickness."

The report covers the fiscal year ending June 30, 1916. During that time, 637,274 acres of coal land withdrawals were made. For the most part these lands are in Colorado and New Mex-

tico. Director Smith points out that, during the time under review, restorations have exceeded the withdrawals by over 2,000,000 acres. In carrying out the policy of the Survey to examine and eliminate from withdrawal as rapidly as possible areas of doubtful coal value, it is pointed out that a large area of non-coal land has been restored in Montana as well as smaller areas in other states. The larger non-coal areas have now been eliminated from withdrawal. Field examinations, as a consequence, have been restricted to a detail study of known coal fields.

HARRISBURG, PENN.

For the first time in 16 years miners in the anthracite coal fields were asked recently to continue work on holidays and possibly aid in operating the mines on Sundays. This proposition, it is understood, was flatly refused by the mine employees. One of the large coal companies canvassed the men in its employ, asking them not to be idle on Thanksgiving Day.

This is the first move of the corporations to have collieries operate on holidays and Sundays and in this way make up for the coal shortage of the markets experienced at this time, and which is believed will result in a coal famine before many weeks have passed.

Although the officials of the collieries did not ask the men and boys to work on Sundays, it is the common belief among the mine employees that had they agreed to work on Thanksgiving Day, another request to assist in operating the mines on Sunday would be the next move of the operators. If one company started holiday and Sunday operation, the others would in all probability fall in line.

The operators state that the one hour less in the working day has proved a big handicap to them in getting out the same amount of coal as in previous years. To work on holidays and Sundays would mean a few hours extra. In this way enough coal could be gotten out to tide the market over the threatened heavy demand for coal and thus prevent a coal famine.

The mine workers gave reasons for not working as the coal corporations requested. The shortage of cars, both mine cars and hoppers to take the mined coal to market, is responsible for the shortage, and not the 8-hr. day, they said. Several of the mine workers' leaders cited cases where the collieries of several of the companies closed at noon because of this car shortage. The men in answer to the argument of the operators say: "Give us the cars and we will mine the coal."

It is learned that one of the large companies operating in the Wyoming region made a canvass among its mine workers to operate on Sundays, but the greater number of miners opposed this. At the collieries under this company, it is stated, the majority of the mine workers are foreigners. Among this class church holidays and Sundays are closely observed. These workers do not report for work on holidays, and in all probability would hold Sundays in the same strict observance. To get this plan adopted will be a serious proposition for the coal corporations.

PENNSYLVANIA

Anthracite

Nanticoke—Two men were killed and another injured so badly that he will probably die by a mysterious explosion that occurred at 7:30 in the evening of Dec. 1, at a new air shaft that is being sunk at Loomis colliery of the Delaware, Lackawanna & Western Railroad Co. Whether the explosion was one of gas or dynamite or whether it came from inside or outside the shaft is not known. It tore down the tower from which the elevator bucket is operated, demolished a fan house, swept everybody within a hundred feet to the ground and choked the top of the shaft so tightly with débris that it was impossible for several hours to make descent into the opening to try and ascertain what damage had been done. The depth of the shaft is between 400 and 500 ft. and the ultimate depth of the shaft will be more than 2,000 ft. Considerable gas has been encountered in sinking this shaft.

Larksville—The No. 3 breaker of the Delaware & Hudson Co. was destroyed by fire at an early hour on Dec. 2, and 800 men and boys were thrown out of employment. The origin of the fire is not known. The flames started in the top of the breaker. The company erected this breaker about 12 years ago. It was one of the biggest breakers in the coal fields. Its frame was of wood covered with metal. The loss is estimated at $135,000. It will require several months to build a new structure.

Jeanesville—The huge banks of coal and slate that stand at No. 4 and No. 5 collieries of the Lehigh Valley Coal Co., will be loaded out and run through the Spring Mountain colliery to be separated and prepared for market. A steam shovel will be installed at the banks. This will greatly increase the coal output of the breaker there, which has taxed all the underground and stripping operations to keep it in fuel throughout the day. The banks that are to be run through the breaker were dumped many years ago and contain large percentages of coal that will help relieve the present shortage.

Pottsville—A fire, declared by officials to have been of incendiary origin, swept the coal chutes of the Philadelphia & Reading Coal and Iron Co. on Nov. 30, causing a loss of about $5,000. The flames spread over the structure, which is Pottsville's almost exclusive source of coal supply, rapidly burning the coal pockets for a distance of 150 ft. and destroyed several coal cars which were under the sheds.

Mt. Carmel—The coal companies in this section on Nov. 26, posted orders to the effect that in the future persons will not be permitted to gather coal on the banks. Arrests are threatened if the orders are violated. Officers have been posted at some of the coal dumps.

Bituminous

Huntingdon—The hearing on the injunction brought by the Rockhill Coal and Iron Co. against the miners at the Robertsdale mines has been postponed. All the mines in the Broad Top region, with the exception of two, have now been closed for over a month, with no prospects of an early resumption. The local coal dealers, unable to secure the usual supply of soft coal for their customers, are delivering anthracite instead, although they are experiencing considerable difficulty in securing a supply of this.

Vintondale—The Vinton Colliery Co. has purchased from the Lackawanna Coal and Coke Co. a tract of 5,800 acres of coal land near Heshbon, Indiana County, which will be developed at once. The tract is one that was opened partially about 14 years ago by the Lackawanna company, but was abandoned after three drifts had been driven 1,000 ft. into the coal. The drifts are still in good condition and it is expected that there will be no difficulty in resuming operations within a short time. A contract for a large number of houses has been let. It is expected that one of the largest mining towns in this part of the state will spring up on the site.

Holsopple—The miners who lost their homes in a recent fire here are being cared for by the Victor Coal Co., which owned the dwellings. Other houses have been given the families. An investigation is to be made into the origin of the fire.

Twin Rocks—An official probe is being made into the fire which recently destroyed the big plant of the Big Bend Coal Co. The loss is estimated at $25,000. This is partially covered by insurance. Incendiarism is suspected. A strike has been in progress at the plant for some time.

Connellsville—The weekly coke production in the Connellsville region recently totaled 408,169 tons or an increase of 9,870 tons over the period for the preceding week. Shipments were 401,231 tons.

Spangler—The Pennsylvania Coal and Coke Corporation, with mines in Cambria, Clearfield and Indiana Counties is constructing new tipples at its plants in Winburn, Clearfield County and Patton, Cambria County. A new tipple will also be built at the company's operation in Beaverdale.

Charleroi—Repairs and partial reconstruction of the old river tipple of the Charleston coal mine of the Youghiogheny & Ohio Coal Co. have been started. It is the intention to fit the mine for river shipments.

Monongahela—It is understood that the opening of the Warner-Leonard mine on the tract owned by that company a short distance from Charleroi is not far distant. This is indicated by the shipment of material recently to that point. The Warner-Leonard Co. here has 264 acres to develop in Fallowfield Township.

WEST VIRGINIA

Charleston—Out of the money left over from the fund contributed for the relief of distress in the Cabin Creek and Coal River floods in August, individual payments have been made to persons rendered needy by losses in the floods, usually $5 to each parent and $2 for each child. More than 2,500 persons are on the list of needy ones.

Fairmont—Shipment of Sewickley vein coal, mined from two new openings along the West Fork River, will probably begin within 30 days, or as soon as the mines being opened by the Orr Coal Co., of Clarksburg, are completed. Men are now at work driving the drift into the outcrop of the coal just below White Rock. The coal here lies a considerable distance above the Baltimore & Ohio tracks, and the new mine tipples will be built with an incline to the drift openings.

Clarksburg—It has been announced that the Elkhorn Coal Co. recently leased 3 mines from the Consolidation Coal Co. and will soon have these drifts in operation. The mines are Nos. 1 and 2 at Interstate and the Ocean mine. These operations have for some time been idle. The Consolidation company had dismantled the equipment and consequently these mines, when started, will be equipped with modern machinery. The inside workings are in good condition, and their operation should be started within 30 days.

East Gulf—The Mead-Tolliver Coal Co. recently loaded its first car of coal from the Beckley vein.

Mullens—The Smith Pocahontas Coal Co. has begun the erection of a new and permanent tipple at its plant on the main line of the Virginian R.R.

Welch—The car situation in this field is about the same, approximately 70 per cent. of requirements being supplied. The companies are adding equipment in order to increase outputs and help make up for the shortage of labor. During the past week no less than three companies in this immediate vicinity purchased mine locomotives.

ALABAMA

Birmingham—Three times in the past year the Tennessee Coal and Iron Co. has advanced wages. The Woodward Iron Co. has done virtually the same thing, taking effect the first of the present month. It is claimed that the wage advance in this district to Dec. 1 amounted to fully one-half million dollars per month. By these increases in wages, fully 20,000 miners will benefit. Among the other companies that will advance wages are the Alabama Fuel and Iron Co., Empire Coal Co. and Roden Coal Co., and the Tennessee Coal, Iron and Railroad Co.

Chief State Mine Inspector C. H. Nesbitt is making inspection of a number of one- to twelve-man mines being operated in the Birmingham district. High prices being paid for this coal by the consumers is responsible for the activity and Mr. Nesbitt reports that there are no less than a dozen such mines to be looked after. One of these operations in Cahaba Valley is employing 12 miners.

Inspection of the Bessie mines of Sloss-Sheffield Steel and Iron Co., where 30 miners were killed in an explosion, has been completed. Work has been resumed.

Tuscaloosa—Two mine openings, the cost of which will be $250,000, will be made by the Semet-Solval Co. in the coal lands purchased near Tuscaloosa recently from the Alabama company. The company recently bought 7,300 acres of valuable coal lands.

KENTUCKY

Greenville—Fire which destroyed the tipple and power house of the Enterprise Coal Co., at Woodson, Ky., has put the mine out of commission and thrown a large number of employees out of work. Insurance of $20,000 will cover the loss only in part it is stated.

Lexington—Twenty practical miners from eastern Kentucky operations have presented themselves at the College of Mines of the State University where they have taken examinations for certificates as mine foremen.

Louisville—The general offices of the Wallins Creek Coal Co. and the Wallins Creek Sales Co., which have been located in Pineville, Ky., for the past two years will be moved to Louisville. The first-named company operates mines at Wallins Creek, Harlan and Black Joe, Harlan County.

Jeff (Hamden Station)—The Kenmont Coal Co. here will begin shipping coal during the week. Three cars will be shipped daily at the beginning. This will be increased by Jan. 1 next.

Hazard—The coal mines around Hazard are prospering and every one is in full operation. An average of about 140 cars daily are coming from the Hazard field. Several new companies are being organized for coal development, and with increases of old companies this field will be producing about 300 cars daily soon after the first of the new year.

Whitesburg—Coal operators in the Elkhorn and Boone's Fork territory of Letcher Co. complain that shipments are much hindered by the embargo placed a few days ago on the cars of the Big Four. Business had revived for several days after the L. & N. lifted its embargo on cars going north of Louisville and Cincinnati, but hopes were blighted by interference of the Big Four, since much of the output goes over that road to northern markets around the Great Lakes.

OHIO

Crooksville—The Sunday Creek Coal Co.'s mines at San Toy have resumed operations after a shut-down of several months for repair work. Steady operations are looked for, as the company is understood to have orders on hand sufficient to take care of the output for several months to come.

Redfield—The New Kehota mine, near Redfield, is being placed in shape for stripping operations, two Marion electric shovels being on hand for the purpose. One is for stripping the overburden, and is a 500 hp. affair, lifting 8 tons at a time, while the other, for picking up the coal, has a 2-yd. dipper. Operations are expected to begin about Jan. 1 next.

Columbus—Ohio railway managers are striking back at shippers who are misusing shipping privileges and unduly holding railway equipment. Hereafter the coal roads of the state will decline to deliver additional shipments of coal to persons whose supply already is large and who are holding it for speculative purposes. This is an individual embargo in preference to one against a community. Inspection by the Ohio Utilities Commission, the Interstate Commerce Commission and the railways have shown that many coal men are holding scores of cars of coal on their tracks, seeking consumers who were in distress and demanding fancy prices far above the market figures. In that way the speculators, by delaying unloading and monopolizing equipment, have been able to secure handsome profits. At the same time they have embarrassed the railways and forced an artificial shortage of equipment and caused great inconvenience to entire communities. They will be unable to do this longer if the railways stick to their practices that were started in part a few days since. Each day each road has a count of all loaded coal cars received at its distributing yards and delivered to coal dealers. With this goes a count of the cars unloaded on

the tracks of each individual or in the railway yards awaiting track room for delivery to the consignee. If the dealer is overloaded and other cars are received for him they are diverted to other shippers and other points where a need for coal exists. This practice robs the speculative coal dealer of the opportunity for holding up customers who are out of fuel and in distress are willing to pay high premiums for immediate supplies.

INDIANA

Paxton—A double explosion—the two coming about 40 min. apart—occurred in the Wooley mine recently and resulted in the injury of five miners. Walter Asbury was burned about the back and head; J. P. White was burned about the hands and feet; "Hud" Watson suffered a fractured skull; Jim McInnes was bruised and cut about the face; John Moore receiving the same injuries. Gas in the main entry was held to be responsible.

ILLINOIS

Taylor Springs—The Taylor Springs mine will resume operation in a short time. Several carloads of repair materials have been received and workmen are getting the mine in shape. The mine has been closed for several years.

Middletown—The Johnson Valley Coal Co. is surmounting the car shortage, so far as its business with surrounding towns is concerned, by using 40 wagons for making deliveries. Teamsters are encouraged to engage in the delivery of coal by being given a price of $2 a ton at the mine. The company, by shipping the coal away, can get $4.50 a ton for it.

Herrin—Williamson County will show pretty near a record November tonnage for this year. This will be close to 450,000 tons. The Chicago & Carterville Coal Co. has the lead with 70,000 tons, judging from the figures obtainable.

Witt—The Illinois Public Utilities Commission has given the receivers of the coal properties of the Chicago & Eastern Illinois Railroad Co. permission to spend $18,000 in reopening Mine No. 12 here and $5,000 to reopen a mine in Vermillion County.

West Frankfort—A $40,000 hospital was dedicated here a few days ago by the West Frankfort Medical and Relief Association, composed of members of the United Mine Workers. The state organization made a loan to the Franklin County organization to aid in the erection of the hospital. The experiment is being watched with interest and it is expected that such associations will be formed in other centers. The West Frankfort association has 3,000 members, who are assessed $1 a month to cover medical and hospital accommodations for themselves and their families.

KANSAS

Troy—Although there have been frequent unconfirmed reports that oil has been struck in Doniphan County, the only known result of the drilling so far is that coal has been struck in two places. A 24-in. bed of coal was found at a depth between 250 and 300 ft. A second bed about 7 ft. in depth has also been discovered, but little can be ascertained as to the quality of the coal. It is reported that if the oil drillers strike the Atchison bed of coal, the Burlington R.R. will sink a shaft to develop it.

Personals

Horace N. Trumbull has been appointed advertising manager of the SKF Ball Bearing Co., of Hartford, Conn.

A. J. Renwick, for several years northern sales agent of the Keystone Coal and Coke Co. at Buffalo, has been made sales manager of the company, succeeding Robert K. Cassatt, resigned.

Robert K. Cassatt has resigned as vice-president of the Keystone Coal and Coke Co. and has disposed of his holdings in that company. Mr. Cassatt, it is understood, will devote all of his time to the banking business of Cassatt & Co.

J. F. Bolinger has resigned his position as foreman with the Broad Top Coal and Mineral Co. at Jacob, Penn., which he has held for 7½ years to accept a similar position with the Rockhill Iron and Coal Co. at its new slope at Wood, Penn.

James Wardlaw, of Scottdale, and **Charles Leighman**, of Buckeye, Penn., have been granted special certificates by Nathan C. Schaeffer, state superintendent of public instruction, by which they are qualified to teach mining. At the special examination held by the state, both men gave satisfactory proof of their ability.

Obituary

Bert Perrine, for several years mine manager of Watson mines Nos. 1 and 2 until mine No. 1 was abandoned two years ago, was killed recently in a rear-end collission between two Burlington freight trains south of Benton, Ill. One other person was killed, and 13 cars reduced to kindling.

David Benjamin, aged 54, a wealthy coal contractor, met a tragic death on his coal-stripping operations at Ebervale on Nov. 28, while his son, Harry, was seriously injured. Mr. Benjamin had gone horseback riding in the morning and visited his extensive stripping operation. While riding in the strip pit his stirrup strap broke, frightening his horse, which ran away and threw him off. Mr. Benjamin landed on his head and was badly dazed. His son Harry witnessed the accident and went to his father's assistance. In order to get to the first-aid emergency hospital as soon as possible for treatment, Mr. Benjamin and his son rode on the steps on a mine locomotive. Mr. Benjamin being more badly injured than it was thought, fainted and toppled from the engine step. His son was also dragged off in attempting to save him. Mr. Benjamin landed under the wheels of the engine and was instantly killed. His son received a fractured leg and ribs and internal injuries. He was taken to the Hazleton State Hospital. Mr. Benjamin was born in Russia and came to the United States with his parents when less than three years of age. He went to Hazleton in 1895 and engaged in the iron business. Through careful business principles he met with success. At the time of his death he was head of the Central Pennsylvania Quarrying, Stripping and Construction Co., president of the Benjamin Iron and Steel Co., and was extensively interested in numerous coal and financial institutions. As a stripping contractor he was one of the largest and most successful in the state. He is survived by a widow and seven children.

Publications Received

Report on the Fertilizer Industry, August, 1916, Federal Trade Commission. Illustrated, 269 pp., 6x9 in.

Annual Report of the Department of Mines of New South Wales for the Year 1915. Illustrated, 213 pp., 8½x13 in.

Report of the State Mine Inspectors of Iowa for the Biennial Period Ending Dec. 31, 1916. Unillustrated, 112 pp., 6x9 in.

Report on Pipe Line Transportation of Petroleum, February, 1916, Federal Trade Commission. Illustrated, 467 pp., 6x9 in.

Chemical Study of Illinois Coal, by S. W. Parr, Illinois Coal Mining Investigations, Bulletin No. 3. Illustrated, 86 pp., 6x9 in.

Coal Resources at District Six, by Gilbert H. Cady, Illinois Coal Mining Investigations, Bulletin No. 15. Illustrated, 94 pp., 6x9 in.

Monthly Statement of Coal Mine Fatalities in the United States, July, 1916. Compiled by Albert H. Fay. Unillustrated, 28 pp., 6x9 in.

The Nitration of Toluene, by E. J. Hoffman, Department of the Interior, Bureau of Mines, Technical Paper 146. Illustrated, 32 pp., 6x9 in.

Report of the Chief Inspector of Mines in India for the Year Ending with December, 1915; Department of Mines, India. Illustrated, 78 pp., 8½x13 in.

Report on Trade and Tariff in Brazil, Uruguay, Argentina, Chile, Bolivia and Peru, June, 1916. Federal Trade Commission. Illustrated, 246 pp., 6x9 in.

Twenty-Ninth Annual Report of the Bureau of Mines, Mining and Mine Inspection of the State of Missouri for 1915. Unillustrated, 173 pp., 6x9 in.

Specific Gravity Studies of Illinois Coal, by M. L. Nebel, University of Illinois Bulletin No. 89. Engineering Experiment Station; illustration; 49 pp., 6x9 in.

Ore Sampling Conditions in the West, by T. R. Woodbridge, Department of the Interior, Bureau of Mines, Technical Paper 86. Illustrated, 96 pp., 6x9 in.

Health Conservation at Steel Mills, by J. A. Watkins, Department of the Interior, Bureau of Mines, Technical Paper 102. Unillustrated, 36 pp., 6x9 in.

The Coal Resources of the Clintwood and Bucu Triangles, Virginia, by Henry Hinds, Virginia Geological Survey, Bulletin No. 12. Illustrated, 206 pp., 7x10 in.

The Production of Iron and Steel in Canada, during the Calendar Year 1915, by John McLeish, Canada Department of Mines. Unillustrated, 48 pp., 6½x10 in.

Magnetic Properties of Cobalt and of Fe_2Co, by Herbert T. Kalmus and K. B. Blake, Canada Department of Mines, Mine Branch. Illustrated, 18 pp., 6½x10 in.

Investigation of the Peat Bogs and Peat Industry of Canada, 1913-14, by Aleph Anrep, Canada Department of Mines, Bulletin No. 11, illustrated, 185 pp., 6½x10 in.

Blackdamp in Mines, by G. A. Burrell, I. W. Robertson and G. G. Oberfell, Department of the Interior, Bureau of Mines, Bulletin 105. Unillustrated, 88 pp., 6x9 in.

Dry Preparation of Bituminous Coal at Illinois Mines, by E. A. Holbrook, University of Illinois, Bulletin No. 88, Engineering Experiment Station. Illustrated, 133 pp., 6x9 in.

The Coke Industry of New South Wales, by L. F. Harper, New South Wales Department of Mines, Geological Survey. Mineral Resources No. 23. Illustrated, 84 pp., 6x9½ in.

Melting Aluminum Chips, by H. W. Gillett and G. M. James, Department of the Interior, Bureau of Mines, Bulletin No. 108, Mineral Technology 14. Unillustrated, 88 pp., 6x9 in.

An Investigation of the Coals of Canada with Reference to their Economic Qualities, by J. B. Porter, Canada Department of Mines, Mines Branch. Illustrated, 194 pp., 6½x10 in.

Monthly Statement of Coal Mine Fatalities in the United States, August, 1916. Compiled by Albert H. Fay, Department of the Interior, Bureau of Mines. Unillustrated, 28 pp., 6x9 in.

Safe Practice at Blast Furnaces. A manual for foremen and men by Frederick H. Wilcox, Department of the Interior, Bureau of Mines, Technical Paper 136. Illustrated, 73 pp., 6x9 in.

Methods of Sampling Delivered Coal and Specifications for the Purchase of Coal for the Government, by George S. Pope, Department of the Interior, Bureau of Mines, Bulletin 116. Illustrated, 64 pp., 6x9 in.

The Lignite Field of Northwestern South Dakota, by Dean E. Winchester, C. J. Hares, E. R. Lloyd and E. M. Parks, Department of the Interior, U. S. Geological Survey, Bulletin 627. Illustrated, 169 pp., 6x9 in.

Annual Report of the Government Mining Engineer, Department of Mines and Industries, Union of South Africa, for the Calendar Year Ending Dec. 31, 1915. Illustrated, 103 pp. and statistical tables, 8½x13 in.

The Use of Mud-Laden Fluid in Oil and Gas Wells, by James O. Lewis and William S. McMurray, Department of the Interior, Bureau of Mines, Bulletin 134, Petroleum Technology 36. Illustrated, 86 pp., 6x9 in.

Abstract of Current Decisions on Mines and Mining. Reported from January to April, 1916, by J. W. Thompson, Department of the Interior, Bureau of Mines, Bulletin 126, Law Serial 8. Unillustrated, 90 pp., 6x9 in.

Preliminary Oil Report on Southern Illinois, by Albert D. Brokaw, covering parts of Saline, Williamson, Polk and Johnson Counties. Extract from Bulletin No. 35, Illinois State Geological Survey. Illustrated, 13 pp., 7x10 in.

Underground Wastes in Oil and Gas Fields and Methods of Prevention, by William F. McMurray and James O. Lewis, Department of the Interior, Bureau of Mines, Technical Paper 130, Petroleum Technology 30. Illustrated, 28 pp., 6x9 in.

The History and Development of Gold Dredging in Montana, by Hennen Jennings, with a chapter on Placer Mining and Operating Costs by Charles Janin, Department of the Interior, Bureau of Mines, Bulletin 121. Illustrated, 63 pp., 6x9 in.

Industrial News

Buffalo, N. Y.—Fifteen of the leading anthracite shippers and dealers of this city have been subpoenaed to testify in the city investigation of anthracite prices in Niagara Falls, N. Y.

Kittanning, Penn.—The Wheeler Mining Co. has been organized with a capital of $10,000. The incorporators are J. L. Wheeler, of Marion, S. C., Ben Record, Elmira, N. Y., and C. O. Maris, of Kittanning.

Terre Haute, Ind.—The Burnett Coal Mining Co. has been organized at Terre Haute, with a capital of $50,000, for the purpose of mining. The directors are J. L. Devenald, D. J. Scott, D. J. Devenald.

Mauch Chunk, Penn.—Judge Barber, on Dec. 1, permitted the Lehigh Coal and Navigation Co. to enter into contract with the supervisors of Mauch Chunk township to make and repair the roads therein for one year.

Cleveland, Ohio—It is reported that the Russell Coal and Mining Co., Cleveland, has sold its mine in the Pittsburgh No. 8 district, at Tiltonville, Ohio, to W. H. Warner & Co., Cleveland. Consideration not stated.

Smithfield, Ohio—The Smithfield Coal Co. has been incorporated with a capital of $1,000, to mine and sell coal. The incorporators are: C. A. McFadden, B. W. Lewis, W. R. Dorsey, M. E. McComb and A. Teegarden.

Somerset, Penn.—The Atlantic Coal Co. has secured a lease on a tract of land one mile south of Somerset, and will begin the installation of a modern plant. About 200 acres of steam coal is involved in this transaction.

Youngstown, Ohio—The Mahoning Coal Co., recently incorporated here with a capital stock of $15,000, intends to open a mine near Austintown on a tract of 50 acres. A. Watson, P. B. Mulholland and others are interested.

Amsterdam, Ohio—The Pittsburgh Number Eight Coal Co. has been incorporated with a capital of $15,000 to mine and sell coal. The incorporators are: C. F. Wagoner, John Lees, Ralph Levinson, E. D. East and Charles Greenberg.

Hindman, Ky.—Long drawn out litigation involving rich coal lands in this (Knott) county

has resulted in the Circuit Court in a judgment for Robert Adams. Robert Bates, opposing party to the suit, will appeal the case.

Birmingham, Ala.—The Sloss Sheffield Steel and Iron Co. recently entered suit in the Circuit Court here against the Pratt Consolidated Coal Co. for $101,000 damages, because of alleged removal of coal from the land of the plaintiff.

Whitesburg, Ky.—It is stated here that the development of the J. C. Day coal-land tract near here will be started soon after the first of the year by J. Henry Hall and others, of Kona Station. A developing company is to be formed.

Sullivan, Ind.—The Vandalia Coal Co., Inc., has announced that work will be begun at once on the sinking for another new mine in the Dugger field east of this city. Each of the new mines is to have a capacity of 3,000 tons per day.

Norfolk, Va.—The steamship "Allagash," which left here with a cargo of bituminous coal, has been reported to the owners as having gone aground off Southeast Pass, near Galveston, Tex. The cargo was destined to New Orleans.

Wheeling, W. Va.—With an authorized capitalization of $10,000, the Glen Marion Coal Co. has been incorporated. The incorporators are Charlton Dixon, A. S. Burger, H. L. Arbenz, Carl O. Schmidt and Neil Moran, all of Wheeling.

New Lexington, Ohio—The Clay Bank Coal and Mining Co. has been incorporated with a capital of $5,000, to mine coal. The incorporators are Herbert Hannigan, S. C. Smith, Samuel Paskell, John Paskell, Lillian G. Smith and Alice Hannigan.

Fairmont, W. Va.—The Sterling Coal Co. is preparing to open a mine on the West Fork, near Westchester, on a tract of 500 acres of Sewickley vein coal, valued at $250,000. A drift mine, with a maximum capacity of 1,000 tons a day, is to be operated.

Emanuel, Ky.—The Turner Jellico Coal Co., recently incorporated with a capital stock of $5,000, to develop 200 acres, has elected J. D. Turner president; Jesse Turner, vice-president and general manager, and Grant Mason, secretary-treasurer.

New Philadelphia, Ohio—The Beaver Dam Coal and Mining Co. has been incorporated with a capital of $50,000 to mine and sell coal. The incorporators are: N. E. Thomas, J. N. Rowley, Norman C. Schneider, Homer I. N. Stafford and John C. Thomas.

Homer City, Penn.—The Homer City Coal Co., with main office in Johnstown, has decided to manufacture mine cars for its own use. A steel and concrete plant will be built. Later it is possible that the company will manufacture cars for the mining trade.

Miami, Okla.—Articles of incorporation have been filed at Oklahoma City for the Jay Bird Mining Co., with a capital of $8,000. The incorporators are G. L. Coleman, J. F. Robinson and B. A. White. The company will operate coal mines in this section.

Johnstown, Penn.—The interest of the Bird Coal Co., consisting of a large tract of mineral and two openings, was recently sold to a syndicate of Eastern capitalists. It is expected that the coming spring will witness a considerable improvement in the plant.

Pikeville, Ky.—O. P. Chatfield and others, of Cincinnati, were in Pike County recently, arranging for a coal development in the vicinity of Robinson Creek, on the Baltimore & Ohio's Shelby Creek Branch railroad. A company will be organized for the new work.

Johnstown, Penn.—The Emmons Coal Mining Co. has purchased the mines at Fallen Timber, in Cambria County, and a tract of coal owned by Charles E. Potter. Possession will be given at once and the plant improved and the mineral developed on an extensive scale.

Steubenville, Ohio—Local business men have purchased a large tract of coal land in Harrison County in the vicinity of Cadiz Junction, and have formed what is to be known as the Unity Coal Co., which will be incorporated under the laws of Ohio with a capital stock of $100,000.

Knoxville, Tenn.—The Camargo Coal Co. has been organized with a capital stock of $50,000. The incorporators are L. I. Coleman, H. F. Knox, John M. Thorbury, J. T. Powers and J. A. T. Moore. The purpose of the incorporation is to engage in general mining operations.

Charleston, W. Va.—The Valco Coal Co. has been organized with an authorized capital of $20,000. This firm will operate in Kanawha and nearby counties. The incorporators are Albert G. Sharpe, of Huntington, Otto Cox, E. M. Cox, Roy Cox, Homer L. Cavender, all of Charleston.

Logan, W. Va.—The Loma Coal Co., of Logan, was recently granted a charter and will operate under the laws of West Virginia in the Triadelphia district. The capitalization is $50,000 and the incorporators are Justin J. Ross, B. L. Flynn, R. B. Sims, of Logan, F. E. Hutchinson and E. J. Jenkins, of Manbar.

Bland, Va.—The Newberry Land, Coal and Coke Co. has been organized among heirs of the late Herman Newberry, of Bland. This company owns 10,000 acres of fine coal land in Logan County, W. Va. It is said that the company intends to lease a portion of the land to other companies, but will develop several thousand acres itself.

Pomeroy, Ohio—It is reported that large interests are taking up a tract in the Willard district, contingent on being able to secure about 8,000 acres, and that in this event they will construct a $250,000 plant to work the operation. The Hocking Valley will extend its line from Kerr's Run to the district if the operation is opened.

Steubenville, Ohio—A shortage of coke is given by the officials of the Carnegie Steel Co. as the reason for blowing out the Riverside furnaces here. It is understood that the suspension of operation is permanent. About 175 men were thrown out of employment. This plant had been idle for eight years, when operations were resumed last March.

Beckley, W. Va.—With an authorized capital of $125,000, the Bower Smokeless Coal Co., with chief works in Raleigh County, was recently granted a certificate of incorporation. The incorporators are L. J. Baumgardner, of Beckley, G. R. Stahl, of Stotesberry, E. B. Wray, R. F. Roth, of Glen White, A. B. Stahl, of Wilkes-Barre, Penn.

Hazard, Ky.—The Mowbray-Robinson Lumber Co. has placed mortgages here for sums aggregating over $1,000,000, to be used in developing about 40,000 acres of rich coal and timber lands in Perry, Leslie and Knott Counties. It is said that the new work is billed to start early in the new year. The coal will be leased by an operating company.

Columbus, Ohio—The Superior Coal and Dock Co. has been incorporated with a capital of $300,000 to operate docks by D. N. Postlewaite, Ralph G. Martin, R. J. Reynolds, E. Braganier and E. Hauck. The concern is organized to operate large coal docks recently purchased by the Maynard Coal Co. interests, at Superior, Wis., from the Sunday Creek Coal Co.

Columbus, Ohio—C. E. Thorpe, inspector for the Ohio Utilities Commission, assigned to investigate coal embargoes at Akron, Ohio, reported to the commission that the Baltimore & Ohio embargo will be lifted shortly for carload shipments, and that the Pennsylvania Railroad Co. has lifted all embargoes and that the Erie Railroad Co. has lifted its embargo against coal.

Charleston, W. Va.—The Monongahela Coal Land Corporation of New York has been organized by Baltimore capitalists and holds for development 23,000 acres of property in the northern part of West Virginia. The authorized capital is $4,500,000, and the incorporators are Alfred W. Galloway, Maxwell C. Byers, Charles E. Kobeloch, Clarence H. Porter and Carl F. Diller, all of Baltimore.

Wheeling, W. Va.—Construction work was begun on Nov. 28, on a new railroad from this city to Greene County, Penn., which is to be extended later to Connellsville to provide a short connection between Pennsylvania lines here and those along the Monongahela River. The new line will be known as the Wheeling Coal R.R., a Pennsylvania subsidiary and will tap rich coal fields in the two states.

Huntington, W. Va.—The Jenny-Driver Co., of Huntington, has been organized by a number of Huntington business and professional men, and development work will be commenced as soon as a charter has been granted. The incorporators are A. S. Driver, E. L. Jennings, D. R. Heffley, W. W. Driver and M. C. Jennings, all of Huntington. The company has a lease on approximately 400 acres of coal land at Julien.

Hellier, Ky.—The Kentucky Solvay Coal Co. recently organized by Ashland (Ky.) and Boston people and that has taken over the Elkhorn Consolidated Coal and Coke Co., announces the building of from 75 to 100 coke ovens, the building of 50 more miners' houses, the opening of new mines, building of additional trackage, and a number of other extensions and increases in the plant. The new work will be started at once.

Yeager, Ky.—The Detroit-Kentucky Coal Co. organized recently for development of a coal-land tract—the Old May tract—on Robison Creek, on the Baltimore & Ohio's Shelby Creek Branch, announces the building of 75 more miners' houses, a commissary building, coal tipples, a Y. M. C. A., a school building and much grade work and road building—the new work to begin within ten days. Kentucky and Michigan people are at the head of the new mining plant.

Harrisburg, Penn.—The anthracite price commission held another session in this city on Dec. 1 at which time considerable time was given to hearing testimony as to the possibility of cheap transportation via the various water routes leading out of the anthracite region. It is now expected that the commission will hold no further meetings and will prepare their report for presentation to the governor on the first of the year, as provided in the act creating the commission.

Cincinnati—A "pop" rise in the river caused by rains above, recently brought down several large tows of coal, 13 boats being reported on the move, with 155 barges, and a total of between 60,000 and 80,000 tons of Pittsburgh coal. Most of this fuel comes to Cincinnati, although some is destined for way points. Better shipping conditions are looked for on the river as the season advances, a considerable amount of rain and snow being normal during December.

Columbus, Ohio—The Southern Ohio Coal Co. has been incorporated with an authorized capital of $50,000 to operate the mines of the Starr Mining Co., at Starr, Ohio. The incorporators are W. Wilson Carlisle, Luther L. Boger, J. S. McVey, D. N. Postlewaite and R. J. Reynolds. It will be operated as a subsidiary of the Central West Coal Co., which will be its selling agent. The mine, which was opened in 1908, has an output of 500 tons daily, and has been in the hands of a receiver for some time.

Columbus, Ohio—Renewed operation of that portion of the Marietta, Columbus & Cleveland R.R. west of Palos will begin in a short time, the Black Diamond Co., of Columbus, having purchased the property from Henry H. Isham, of Elizabeth, N. J.; J. C. Riddle, general manager, and D. B. Torpy, receiver for the road, which was abandoned Oct. 31, 1915. Acquisition of the road, about one-third of the total trackage, will enable the Black Diamond Co. to secure an outlet for the coal from its property.

Dupont, Penn.—A cave occurred under the Laurel Line railroad tracks on Nov. 30 a few minutes before a southbound train was due, but the watchfulness of a trackwalker resulted in the discovery of the subsidence and averted what might have proved a serious accident. The cave was 20 ft. deep. Forces of men were put to work and within a few hours traffic could be resumed. A second cave occurred near North Pittston Station. The workings of the Hillside Coal and Iron Co. are under the tracks of this road.

Elm Grove, W. Va.—The Elm Grove mine, recently changed hands, and there are prospects of a new railroad being built up Big Wheeling Creek. The new company has bought up all available lands in the surrounding country, and is getting ready to sink at least two new mines and perhaps others. It is said that at least 500 men will be employed and from 2,500 to 3,000 tons of coal per day will be produced. Besides the new mine, improvements amounting to $50,000 will be put upon the old mine, and it is estimated that at least 1,000 tons of coal will be produced there daily.

Carmichaels, Penn.—Material and equipment have been placed for the drilling of three test holes on the property of the Youngstown Sheet and Tube Co. It has been unofficially stated that the holes are to be drilled immediately to determine the dip of the coal, and that a shaft for its operation will be put down within a short time. It is said that a large coal and coke plant will be constructed by the steel company on its properties as quickly as possible. The Youngstown Sheet and Tube Co. is the owner of 6,000 acres of coal in this vicinity which is to be operated at a plant to be constructed about one-half mile from the town, eastward toward the Monongahela River. It is said that the plant will be the largest in Green County.

St. Louis, Mo.—The Bald Eagle Coal Co. recently filed in the United States District Court an involuntary petition in bankruptcy. In the petition, signed by Oliver L. Winkle, president of the company, it is stated that the high price of coal has forced the company into bankruptcy. The company formerly operated the Winkle mine but latterly has not had a mine of its own. It had contracts for furnishing coal to the United States Government through the Depot Quartermaster at St. Louis and for furnishing part of the requirements of the St. Louis water-works. The company has not been able for some time to make the deliveries called for by its contracts and the quartermaster and the city officials have been buying in the market and charging the difference to the company.

Charleston, W. Va.—Statistics compiled by the Chesapeake & Ohio R.R. show that shipments over that line for the first ten months of the present year, were more than four million tons greater than in the same period of the preceding year. From the New River, Kanawha and Kentucky districts, the Chesapeake & Ohio, during the month of October, hauled 2,223,080 tons of coal, while in the same month of 1915 the shipments were only 1,352,680 tons. The total tonnage of these districts shows a considerable increase during the past five years. Shipments of coke have more than doubled in 1916 over the same months of 1915. From January to October, inclusive, 1915, the coke shipments were 221,353 tons, while in the same period of 1916 they were 453,522 tons.

Frankfort, Ky.—More than 100,000 acres of valuable mineral and timber land on the middle fork of the Kentucky River in Letcher County, Kentucky, have been thrown back into the Letcher Circuit Court by the Kentucky Court of Appeals, for retrial of the state's forfeiture claim, which had been approved in the lower courts. Default judgment was taken against the heirs of A. F. Baum and W. M. Smith, original patentees—some 20 in number residing in the East—after a warning order had been posted on the courthouse door at Whitesburg. C. S. Cobb was the only claimant who had notice and his three-eighths interest was excepted from the forfeiture judgment. The proceedings were declared void by the Court of Appeals because the petition of the Commonwealth had not contained a description of the lands, beyond the numbers of the patents, or included the title papers. The heirs will now contest the claim of the state.

Market Department

GENERAL REVIEW

Anthracite slows down due to the mild weather. Reactionary tendencies in bituminous though no important recessions. Closing of Lake trade causes no increase in supplies. Better car supply in the Middle West.

Anthracite—The very unseasonably mild weather that marked the first half of the current week had a restraining influence on buying and the situation is notably easier though without any important recessions. That the market is capable of withstanding such a strongly adverse influence is causing considerable speculation as to what the result will be under more seasonable temperatures, and more particularly in the advent of severe weather and bad storms interrupting transportation facilities. The abnormal prices on bituminous coal is diverting considerable business to the anthracite steam grades, and it is possible that some of this may develop into permanent business. At outlying points, such as New England, there is no slackening up in the urgent call for fuel; dealers' bins are frequently empty for days at a time, and the growing belief that distributors are discriminating against shipments in that direction is causing much feeling locally.

Bituminous—Reactionary tendencies continue the dominant feature of the trade, though it is a significant fact that the declines, as shown in our table of comparative average prices of 13 representative coals, is scarcely significant, the loss this week being only 2c. per ton as compared with 13 to 14c. per ton the week previous. This would indicate that while buyers are less urgent in their demands, the selling interests are holding very firmly to their prices. The market shows evidence of having accepted the prevailing high prices as the normal level for the time being at least, though buyers are making aggressive efforts to bring about further recessions. The situation hinges largely on weather conditions; in view of the very unseasonable temperatures such as marked the opening of the current week, the market has been exceptionally well sustained, and with the advent of colder weather, accompanied by storms and interruptions to transportation, which may be reasonably expected at any time, further advances will occur. The export business has fallen off very sharply under the combined influence of a scarcity of both coal and vessel tonnage, together with a very sharp advance in ocean freights, which are again back to about maximum figures.

Lake Trade—The trade is marking time, pending some further developments, no significant changes of any kind having occurred. In spite of the gradual closing down of Lake shipments, there is no apparent improvement in the car supply, the railroads just about holding their own. Improved shipments on contracts have had a tendency to relieve the more urgent pressure for prompt coal in some instances. The unusually open weather has enabled the domestic trade to accumulate some additional reserve stocks against lower temperatures which are sure to come later. A partial failure of the natural-gas supply in many districts is causing a great many industrial consumers to adopt coal burners, and thus throwing an additional demand on the market. The acute shortage that characterized the market a short time ago, forcing a number of public service corporations to buy coal at very exorbitant figures, is not evident at this time, but with any interruption to transportation, such as might be occasioned by severe storms, there is very likely to be a return of these conditions.

Middle West—A decidedly reactionary tendency has developed, particularly in certain spots. The situation is decidedly mixed, with the market maintained largely by anticipations of lower temperatures rather than any conditions prevailing at the moment. It is reported that about 15,000 cars from the iron region of the Northwest will soon be released for use in the coal fields, which will tend to further accelerate the movement. The usual pre-holidays dullness in the market is also now close at hand, if the initial stages have not already set in. Constructive factors are not lacking, however, steam consumption continuing at a maximum rate, while there is a constantly broadening demand from new markets. There are specially heavy orders coming in from the Northwest, where it is clear the Lake shipments are going to prove entirely inadequate. A feature of the week's developments has been the increased arrivals of Eastern coal, with promises of still further shipments to come.

A Year Ago—Anthracite in short supply, but consumers still generally indifferent. Indications of a runaway market in bituminous. Continued advance in ocean freights. Excellent situation at Pittsburgh, and the Middle Western trade is speeding up.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 13 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Last Year	Dec. 9	Dec. 2	Nov. 25	Nov. 18	Nov. 11
Clearfields	$1.55@1.80	$4.75@5.75	$4.75@5.75	$4.75@6.00	$3.65@3.45	$3.50@4.25
Cambrias and Somersets	1.75@2.00	5.25@6.25	5.25@6.25	5.25@6.50	4.00@5.25	3.75@4.75
Pocah. and New River[1]	4.00@4.30	9.00@10.00	9.00@10.00	9.00@10.00	8.50@9.50	8.50@9.00
Philadelphia						
Georges Creek	1.95@2.10	6.00@6.25	6.00@6.50	6.50@7.00	7.00@7.25	7.00@7.25
W. Va. Freeport	1.50@1.60	5.00@5.25	5.00@5.25	5.00@5.50	6.25@6.50	6.25@6.50
Fairmont Gas mine-run	1.30@1.40	5.25@5.50	5.25@5.50	4.75@5.00	6.45@6.55	6.45@6.50
Pittsburgh[2]						
Mine-run	1.15@1.20	4.25@4.50	4.25@4.50	4.75@5.00	4.75@5.25	5.00@6.00
¾-in.	1.25@1.35	4.25@4.50	4.25@4.50	4.75@5.00	4.75@5.25	5.00@6.00
1¼-in.	1.35@1.45	4.25@4.50	4.25@4.50	4.75@5.00	4.75@5.25	5.00@6.00
Slack	.95@1.00	4.00@4.50	4.25@4.50	4.50@4.75	3.75@4.25	4.50@5.50
Chicago (Williamson and Franklin Co.)[2]						
Lump	1.60@1.75	3.50@4.00	3.50@4.00	3.50@4.50	3.50@4.00	3.00@4.50
Mine-run	1.10@1.15	3.50@4.00	3.50@4.00	3.50@4.00	3.25@3.75	2.50@2.75
Screenings	.75@0.80	3.50@3.75	3.50@3.75	3.25@3.75	3.00@3.50	2.25@3.00
Gross average	$1.55@1.68	$4.81@5.29	$4.83@5.31	$4.94@5.45	$4.90@5.35	$4.82@5.54

[1] On cars Boston and Providence. [2] Per net ton.

BUSINESS OPINIONS

Iron Age—The November rush of pig-iron buying, and the excitement attending it have given way to a quieter market. There have been good sales in December, but the rise of Northern iron to $30 at Eastern and Central Western furnaces has had a sobering effect on many buyers. In the steel market the week's developments point more strongly to sustained high prices, and the inability of some mills to meet the demands upon them both in domestic and foreign trade is more marked.

American Wool and Cotton Reporter—Increasing strength is the dominant feature of the wool market. It is not a question of prices, but where to get the wool. There are strong indications that at the late end of the season, before the new clip is reached, the greatest shortage in wool this country has ever seen will be felt. There has not been quite so much activity this week. Sales totaled 6,250,000 lb.

Marshall Field & Co.—Current wholesale distribution of dry gods is running ahead of the corresponding period of a year ago. Road orders for both immediate and future delivery have been heavy. Collections are ahead of the same week 1915. Prices are firm.

Dun—Business enters on the final stage of its most prosperous year with activity unabated and the rise in prices continuing, yet with clear evidence of commendable judgment and prudence in many quarters. Wholesome conservatism is increasingly apparent in industrial channels, as in banking circles, and the doubts as to the economic changes that must ultimately be experienced are reflected in the disposition to provide against possible contingencies in the future. Commercial failures this week in the United States are 247, against 313 last week, 283 the preceding week and 361 the corresponding week last year.

Bradstreet—Ruffles on the surface of the stream betray the existence of some eddies, but generally speaking, the current of trade and industry runs broader and deeper than ever before at this date. The need of cooler weather as a stimulant to retail trade is mentioned in a few dispatches, but with early active holiday demand and a new wave of wage advances reinforcing the abnormally large current business, complaint from this source is at a minimum. Something like a revolt of consumers was witnessed in the markets for food this week, and Thanksgiving demand for poultry and other lines was disappointing to dealers at some cities. In grain and hog products talk of a food embargo and resulting declines in prices have fostered the belief that prices have reached their zenith for a time at least.

Dry Goods Economist—In many centers and in various lines of industry new impetus to the retail busines has been given by wage advances. In these higher rates of pay workers in textile mills and in printing, bleaching and finishing plants share. Moreover, it is believed that advances will be made by many more textile plants at an early date. The higher pay naturally tends toward further advances in the price of the product, and is already reflected in new quotations ½c. a yard higher on important lines of prints. The advances this week also include ginghams and tickings.

Atlantic Seaboard

BOSTON

Market maintains status of a week ago. Pocahontas and New River firm, with few spot sales. Only dribbling receipts of Georges Creek. Dealers apprehensive of anthracite possibilities.

Bituminous—There is practically no change in the New England market. The shippers who have heavy contract obligations are just about able to keep customers supplied without making more than a very few purchases in the open market. If it were not for the reserve stocks which several of the larger consumers piled up early in the season there would now be a very real panic for spot coal. As it is, the railroads in particular took pains to accumulate fuel and they with others are that much less dependent upon current shipments for immediate needs. When occasionally a steamer is held at Norfolk for a fortnight awaiting coal a reserve stock is a good asset.

To show how closely some of the steam users are obliged to run, a 1,800-ton cargo of New River was loaded at a Boston rehandling plant and shipped around Cape Cod to New Bedford to relieve a case of distress there. In other words, the Hampton Roads agencies are hard put to it to keep up with their obligations. Most of the spot sales f.o.b. are still between shippers themselves in order to clear boats. It is from such sources that most of the demand comes at prices from $7 up, f.o.b. Hampton Roads. Car-supply on the Virginia roads is poor and irregular and operators also face the widespread lack of miners.

For shipment inland the distributors are able to keep abreast of their contract obligations. In one or two cases consumers have assented to advances in price as an alternative to a materially reduced tonnage on the contract basis. This, however, is not general. Those distributors who sold for delivery prior to Oct. 15 or Nov. 1 are still making hand-to-mouth shipments but so long as factories can keep going there is a disposition to be grateful for what is done, all the circumstances considered. On-car prices at Providence, Boston and Portland are $9.50. Those buyers whose contracts have expired are extremely cautious about the quantities they buy on this basis. Sales are therefore only for scattering tonnages.

There are rumors of new alignments next year among the various agencies, but so far no positive announcements have been made. Among others the interests which are influential in the Virginian Ry. are understood to be making plans looking to comprehensive business in this territory in 1917.

There is the usual dearth of Georges Creek in this market. Only by substituting other grades and allotting coal on a percentage basis are the shippers able to keep their trade pacified. The fleet belonging to the chief factors is moving very slowly, being much hampered by detention at the Baltimore terminals.

In the Pennsylvania grades there are no developments of consequence. On present prices the shipper with "free" coal has to canvass the

trade pretty closely to place his output. Consumers are few who will buy 1,500 to 2,000 tons in a lot at the highest figures known since 1902. When quotations approach $10 alongside there is small room for a commission on top, and most of the sales now being made are at first hands. More than once lately coal on wheels at the loading ports has had to be "sacrificed" and that is another reason for the wide margin of fluctuation that seems to be characteristic just now of the trade in Pennsylvania bituminous.

Coal for the Boston & Maine consignees is still embargoed, except via the Boston & Albany via East Somerville, Mass. This routing means an extra rate, but all concerned in receipts are caring nothing at all these days about an extra freight rate so long as they get fuel. Operations that normally ship 600 to 700 tons daily are struggling along on but a few cars a week, and there is a long list of Pennsylvania coal shippers who are far in arrears on their contracts.

The last cargoes are now going forward to the Penobscot River, although one or two of the shippers have already shut down on further shipments in that direction.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. & Som's't	Geo'gs. Creek*
Philad'la...	$6.00@7.25	$6.25@7.50	.....
New York..	6.25@7.40	6.50@7.75	.....
Baltimore..	.....	.....	.....
F.o.b. mines	4.75@5.75	5.25@6.25	.....

*On contract.

Pocahontas and New River are quoted at $7@7.50 f.o.b. Norfolk and Newport News, Va., for spot coal, and $9@10 on cars, Boston and Providence, for inland delivery.

Anthracite—The mild weather is the salvation of the retail coal men. Were we in the midst of bitter cold there would be some real alarm over the anthracite situation. There are Boston dealers who have been without all sizes now for several weeks. Some of them have barges that have been waiting at New York loading piers three weeks or more, with demurrage piling up high.

Companies which withdrew their barges from the trade this side of Cape Cod are still chartering them outside and under the surface there is a good deal of criticism over the way this market has been dealt with by certain of the distributing interests. There is quite an amount of "independent" coal to be had at up-set prices but dealers here are loath to take it on so long as retail prices remain on the basis of $9.50 per net ton. Several purchases have been made by dealers in order to discharge their obligations, but the consensus of opinion now seems to be not to sell more coal except to regular trade and then only in small lots until there are other developments.

Some of the cargoes now en route here are made up of dock screenings, washery pea and washery chestnut, although the reserve of the latter is understood to be rapidly dwindling.

A cargo of "independent" stove and chestnut was quoted this week at $9.85 along side a Sound port. This shows a slight weakening in the speculative market.

PHILADELPHIA

Anthracite quiets down and premiums moderate. Individuals paying more attention to local market. Egg coal easy and heavy shipments of chestnut. Pea plentiful in some quarters. Bituminous less active though little coal offered. Car supply poor. Serious controversies as to contracts.

Anthracite—The trade has experienced the most peaceful week in two months. The continued mild weather was welcomed by the big companies, who were trying to keep the market supplied at circular rates, though it is not so certain the smaller operators and middle houses are enjoying the lull. However, the premium markets in the East and West have settled down to a rate running from $1 to $1.50 over the circular. Sales are not negotiated so readily, but still they are being made.

It surprises some to see with what complaisance the smaller selling agencies view the attitude of the retail dealers here. To ship as much coal as they did to New York, New England and the West, necessarily brought neglect to much of their Philadelphia trade and the latter now threaten vengeance when times become normal, though the shippers do not take this seriously. When coal is in short supply they can secure their share of the business at circular rates and if it becomes too plentiful they simply offer it at a lower rate than the big companies. Neither are the big companies being deceived. They know dealers who were cared for during the stress of 1912 and who did not come back until 1916. Some buyers are now bitterly complaining that they have received little coal, but as a matter of fact they do not deserve any, as the shippers they are negotiating with are in no way obligated to care for them.

With the easing off of the panic conditions some of the salesmen are beginning to put in their appearance. The salesmen of one of the larger shippers have been around recently estimating the amount of each size in the yards of the dealers. It is not known what purpose this is intended to serve, except possibly that it is to be used in apportioning what tonnage they may be able to ship to this city.

Broken continues out of the market and the big shippers almost daily refuse $4 and over in order that they may apply their small production on contracts at $3.50.

The demand for egg for domestic use has fallen off locally, but is still active in outside markets, though not at the fancy prices of three weeks ago. It would be no particular trouble to get a small tonnage of this size, if necessary.

Stove is as short as ever and dealers' bins remain empty or nearly so though since retail business has fallen off, the situation is not so acute. The retailers are just as active in their efforts to buy, as they realize there will be a rush of business later. The suburban dealers and those in the western part of the city are particularly short of stove—dangerously so. If a dealer receives a car or two his competitors all seem to learn of it and hurry to borrow a ton or two.

Chestnut has been easier this week. One company relieved the situation to a large extent with fair shipments, though the demand is still heavy and likely to continue so. In fact, there is an occasional dealer who declares he has plenty of stove, but is short of nut.

As predicted, the liberal shipments of the past three weeks have greatly lessened the call for pea. Quite a number of the smaller dealers now have all they desire and requests to suspend shipments are becoming frequent. None of the companies is now charging the dealers above the circular rate of $2.80, but in some cases the manufacturers are being asked a premium of 20c. a ton. Now that the anthracite commission has about completed its investigation the big companies may even return this size to the new price of $3, which they announced a few weeks ago, but suddenly abandoned.

All steam sizes are in most active demand and the anthracite people may win some new and permanent business. The collection departments report that the high standard established early in the fall is being maintained.

Prices per gross ton, f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide, are as follows:

	Mines	Tide		Mines	Tide
Broken	$3.60	$4.75	Buck	$2.00	$2.90
Egg	4.15	5.25	Rice	1.25	2.15
Stove	4.10	5.60	Boiler	1.10	2.00
Nut	4.50	5.55	Barley	1.00	1.90
Pea	2.80	3.70			

Bituminous—The market has lost much of the excitement that characterized it a few weeks ago, though buyers continue on the lookout for additional supplies. Salesmen have no difficulty whatever in securing interviews, as all consumers are anxious to keep in close touch with conditions. Salesmen occasionally have some coal to offer; they refuse to be committed on an order until it can be confirmed from the office.

All shippers continue to complain of the shortage of cars, and the average seems to be about 50 per cent., although there are plenty of reports of less. Shipments received here last week were fair, but much disappointment has been expressed on account of navigation on the Lakes not closing at the customary time and there now seems little probability of this market experiencing any relief from that source for a few weeks at the least.

There have been but few price changes this week, though there is a tendency to slightly lower figures in some instances. The market has apparently settled down to a routine, with most sales being made around the $5 mark and the opinion is expressed in many quarters that this standard will be maintained for the remainder of the winter. However, the operator interests are not willing to admit this and one often hears the statement from them that $7 coal will soon be back again. The conditions which produced this figure have certainly not improved and with the first bad weather, and the blockading of transportation, prices should advance to record figures.

Loud complaints are heard from the operators who are losing money on contract coal, due to wage increases. In a number of instances these increases have amounted to as much as 33⅓ per cent. and so critical has the situation become that the bituminous operators' associations are beginning to consider the question of procuring injunctions against such of their number who, in violation of their agreement, have granted the miners' demands. With the signing of the new wage agreement with the miners last spring, many contracts were made for the same length of time without further stipulation as to increase of wages, and it is this lack of faith among the shippers themselves that is causing serious loss to the concerns who are endeavoring to live up to their contracts.

The prices ruling at this time per gross ton at mines are about as follows:

Georges Creek Big Vein	$6.00@6.25
South Fork Miller Vein	6.00@6.25
Clearfield (ordinary)	5.25@5.50
Somerset (ordinary)	5.25@5.50
West Va. Freeport	5.00@5.25
Fairmont gas, lump	5.50@5.75
Fairmont gas, mine-run	5.25@5.50
Fairmont gas, slack	4.75@5.00
Fairmont lump, ordinary	5.00@5.25
Fairmont mine-run	4.75@5.00
Fairmont slack	4.75@5.00

NEW YORK

Anthracite prices drop and demand lighter. No supplies at Tidewater. New England calls for coal. Retailers reduce prices. No call for bituminous and no supplies. Industrial plants running short and reënter the market. Prices easier.

Anthracite—There has been a further softening of prices due to mild weather conditions. However, there is no surplus and middlemen suddenly called upon for shipments of either egg or stove or a mixture of the three domestic coals are hard pressed to get a cargo together. Demand at Tidewater has taken a decided drop and shippers are not rushed. Embargoes are in force on several lines and especially in New England where the roads are congested with freight.

While Tidewater quotations show a further decline, occasional sales are reported in New England more than $1 higher. Producers do not look for anything like a normal output this month owing to church holidays, pay days and Christmas.

The local market was very erratic early this week, ranging from $7@8.50 within a few hours, but with most sales at around $7.50. Some retailers who advanced their prices last week announced a reduction of from 50c. to $1 a ton on Monday.

Demand along the line has dropped but there is a steady call and dealers are filling their bins. Mine quotations for stove, egg and chestnut range from $5.50@6.25. At Tidewater egg and stove are the shortest and straight cargoes of either size are impossible to get. Chestnut is freer and some shippers quoted from 25c. to 50c. below other coals. Pea coal is in fairly good demand.

The steam coals are holding their own but the supply is tighter. Companies with some of these coals in stock are drawing heavily on them.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	5.45	$7.00@7.50
Stove	5.70	7.00@7.50
Nut	5.75	7.00@7.50
Pea	4.00	5.25@5.50
Buck	2.75	4.25@4.50
Rice	2.20	2.50@2.75
Barley	1.95	2.20@2.60
Boiler	2.20	.....

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—So many different quotations could be obtained for bituminous early this week that it was difficult to tell where the market was. There was a decided slump in prices but dealers predicted that higher prices would follow with a few days of cooler weather. The situation was very uncertain the first part of the week. There was comparatively little coal on hand and practically no demand. The failure of many of the miners to return to work after Thanksgiving Day curtailed production and very little coal was on the road. It is probable that there will be less coal available this week than for some time.

The miners in the Broad Top district after an idleness of a couple of weeks returned to work on Monday. In other sections the labor situation is serious and operators are worried. Industrial plants which have been keeping out of the market the past few weeks are running short and their representatives are looking for free coals.

One large company is reported to be closing contracts for portions of their supply at an average of $3 per ton, a considerable advance over this year's figures. Other operators and middlemen are not signing up. New contracts it was said would contain labor clauses and other features not now included.

The car supply shows no improvement and producers who can obtain a good percentage of their requirements are short of men. Quotations for Beech Creek coals on Tuesday were around $5.75 at the mines while grades along the Pennsylvania were quoted around $5.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	South Amboy	Port Reading	Mine Price
Georg's Crk. Big Vein	$6.75@7.00	$6.75@7.00	$5.50@6.00
Tyson	6.25@6.50	6.25@6.50	5.00@5.50
Clearfield	6.25@6.50	6.25@6.50	5.00@5.50
South Frk.	6.25@6.50	6.25@6.50	5.00@5.50
Nanty Glo.	6.25@6.50	6.25@6.50	5.00@5.50
Som'r. Co.	6.25@6.50	6.25@6.50	5.00@5.50
Que'ho'ing.	6.25@6.50	6.25@6.50	5.00@5.50
W. V. Fa'rm't Th'r'qua	6.25@6.50	6.25@6.50	4.45@4.70
Mine-run	6.15@6.30	6.15@6.30	4.45@4.70
West. Md.	6.25@6.30	6.25@6.50	5.00@5.50

BALTIMORE

Car scarcity again pronounced and little surplus of fuel at tide. Consumers shy at continued high prices. Anthracite situation easier.

Bituminous—Car scarcity in this section has again brought its complications to the trade. Over Thanksgiving Day there was a better supply, but what extra coal came through has been absorbed and there is little surplus at Tide now. The only thing that prevents a tight situation here is that consumers are holding off at the continued

high prices, though quotations are a little easier than a week ago. The trade is figuring that new contracts will run as high as $2.50, mine basis, or even better, against about $1.50 for best prices a year previous.

Prices to the trade at the mines are about as follows: Georges Creek, Tyson, $6; Somerset, $5 to $5.50; South Fork, $5 to $5.50; Clearfield, $5.50; Quemahoning, $5.50; Latrobe, $4.50; Freeport, $4.50; Fairmont gas, ¾, $4.50; mine-run $4.25; slack, $4.25.

Anthracite—Mild weather is cutting a figure. The Pennsylvania offered a better car supply in the anthracite regions also, and many dealers got in much-needed supplies of scarce sizes, such as No. 3 hard. With almost spring-like temperatures, there has come a drop in urgent demand for deliveries of hard coal, which has given the trade a chance to catch up.

Exports—Another big slump has occurred in foreign movement. Only one cargo was loaded this week.

HAMPTON ROADS

No abatement in demand. Car supply still light and stocks low. Prices firm.

Demand is still far in excess of supply and delays to vessels are of frequent occurrence. Business is still on a hand-to-mouth basis, with little prospect of any immediate improvement. The car supply does not appear to be any better and stocks are down to practically nothing. As fast as the coal arrives it is dumped into a waiting vessel, and the supply of bottoms is always in excess of the supply of coal. Prices are firm at recent quotations and will hardly show any softening as long as shipments from the mines are so restricted.

The tonnage dumped during the month of November is almost 10 per cent less than October, the Norfolk & Western being the principal sufferer. Shippers are much interested in the report from London that the coal mines have been taken over by the Government. Full details are awaited to see what effect, if any, this action will have on the business of American exporters.

Dumpings in detail, for the month of November, are as follows, gross tons:

Norfolk & Western Ry.	439,093
Virginian Ry.	347,758
Chesapeake & Ohio Ry.	392,886
Total	1,179,737

Prices are firm for Pocahontas and New River run-of-mine as follows: For cargo shipment coastwise and export, $7.50@8 per gross ton; on track, for local consumption, $7@7.50 per net ton; bunker coal, $8@8.50 per gross ton, plus 10c. trimming. Anthracite, $9 per net ton delivered.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the past several weeks:

	Oct. 28	Nov. 4	Nov. 11	Nov. 18
Nor. & West.	133,156	106,276	88,750	103,100
Ches. & Ohio	78,695	78,299	78,827	96,449
Virginian	101,509	85,301	.....	77,266
Total	313,360	269,876	.....	276,815

Ocean Shipping

OCEAN FREIGHTS

Freight rates to all destinations are advancing rapidly owing to the scarcity of steamers and the accumulation of export orders. Shippers of general cargo to French Atlantic ports are now offering equal to the highest rate that was paid last winter, which was the highest rate ever paid, and are having difficulty in securing steamers even at this figure. There were no authentic reports of charters for export coal during the past week.

	Nov. 27	Dec. 4
West Coast Italy	$30.00 about	$31.20@33.60
Marseilles	28.80 about	30.00@32.40
Barcelona*[2]	24.00@26.40	26.40@28.80
Montevideo	14.40 about	15.60 about
Buenos Aires	14.40 about	15.60 about
Rosario	16.80 about	16.80@18.00
Rio Janeiro	12.50 about	15.00 about
Santos	13.00 about	15.50 about
Chile (good port)	8.00 about	8.00@8.50
Havana	4.00 about	4.00 about
Cardenas, Sagua	5.50@6.00	5.00@6.00
Cienfuegos	6.00@6.50	6.00@6.50
Port au Spain	7.50@8.00	8.00@9.00
St. Lucia	7.50@8.00	8.00@9.00
St. Thomas	7.00@7.25	7.25@7.50
Barbados	7.50@8.00	8.00@9.00
Kingston	6.75@7.00	6.00@6.50
Curacao[1]	7.00@7.25	7.50 about
Santiago	7.00 about	6.00@7.00
Guantanamo	7.00 about	6.00@7.00
Bermuda	6.00 about	5.00@6.00
Vera Cruz	7.00@7.50	7.00@8.00
Tampico	7.00@7.50	7.00@8.00

* Spanish dues for account of cargo. [1] And p.c.
[2] Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

COASTWISE FREIGHTS

The tonnage situation shows no change, except possibly from New York to points east. From Hampton Roads $2@2.25 is still the nominal rate to Boston, although no charters are heard this week. To load steamers on regular schedule is about all the shippers will undertake and what few barges and schooners have been placed the past month have been taken either by speculators or by smaller interests which are largely contract free. From Philadelphia $2.25@2.50 is asked on small barges, 850 tons or so, to Boston, but there will be few takers until the anthracite companies will accept them for loading; just at the moment the latter have their hands full loading the barges that take coal on regular fixed arrangement.

To points like Providence and Fall River $1.35 is still the quoted rate from New York on small boats. The problem now is not to get boats but to get them loaded. Practically all the owners are now insisting upon six to eight days for loading and discharging.

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Kremlin[3]	Pernambuco, Brazil	1,054
George W. Elder[1]	Punta Arenas	1,473
Teresa Accame[1]	Genoa, Italy	6,098
Edward Pierce[4]	San Juan, P. R.	6,272
Baydouglas[7]	Buenos Aires, A. R.	5,494
Samoa[1]	La Plata, A. R.	1,795
Storstad[3]	Buenos Aires, A. R.	8,622
Ulysses[3] [6]	Cristobal, C. Z.	12,021
Skinfaxe[7]	Boca del Toro	1,686
Celia[3]	Iquique, Chile	1,452
Bryssel[5]	Puerto Padre, Cuba	1,819
Juno[8]	Italy—any port	5,126

NEWPORT NEWS

Nordland[2]	Barbados, B. W. I.	1,902
Anna M. Hudson[2]	Manzanillo, Cuba	493
Pampa[2]	Puerto Militar, A. R.	3,264
Munorawy[2]	Havana, Cuba	5,996
Malm[2]	Havana, Cuba	1,735
Olaf[9]	Castries, St. Lucia	2,680
Glendhu[2]	Rio de Janeiro	5,600

PHILADELPHIA

Bertha	Puerto Padre	1,067
Lodaner	Havana	
J. Manchester Haynes	Cienfuegos	
Durley Chine	Halifax, N. S.	
Rio Colorado	Rio Janeiro	
Hermod	Havana	1,928
Falcon	San Domingo	

BALTIMORE

Sangstad	Costa Rica	3,202

[1] Pocahontas Fuel Co. [2] Berwind-White Co.
[3] Castner Curran & Bullit. [4] Baker-Whiteley Co.
[5] Smokeless Fuel Co. [6] C. G. Blake Co. [7] C. & O. Coal & Coke Co. [8] C. H. Sprague & Son.
[9] C. & O. Coal Agency Co.

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

Vessel	Destination	Tons	Rate
Hermod	Havana	1,928	
Bertha	Manati	1,067	
Wm. E. Burnham	San Juan		$16.00[1]

BALTIMORE

Hilston	Buenos Aires	1,897	10.00
Jolanda	River Plata	1,712	10.80

VIRGINIA

Aug. W. Snow	Port Spain		

[1] About

Lake Markets

PITTSBURGH

Spot market substantially unchanged in two weeks. Car supply not improved. Factors to make strong market during winter.

The market for spot coal had eased off a trifle at the beginning of last week, growing stronger the middle of the week and then easing off again at the close. Thus far this week the market has been in about the same condition as at the close of last week. From the broad viewpoint, there is no continuous easing off apparent, on account of what is practically the close of the Lake shipping season. There has been no decline other than what occurred a fortnight ago and that was only a small decline. The spot market is fairly well established at $4.25@4.50 for steam and $4.75@5 for gas.

The most that can be said of the car situation is that it has not grown worse. There is no appreciable improvement attributable to the release of cars hitherto engaged in the Lake trade. It may be said that it requires time for the cars to get back, but as Lake shipments have been tapering off for at least a month the first results should have been apparent some time ago.

There are some strong factors as to the coal market for the next few months. The expectation of an easing off in market prices when the Lake shipping season closed was so great that many buyers have no doubt put off entering the market. The weather has been extremely favorable for the season but bad weather is practically certain to come some time, impeding the railroads further. The natural gas supply is shorter than ever and many manufacturing consumers have lost time in the few cool snaps that have occurred, giving a foretaste of what is certain when the really cold weather comes, and at many manufacturing plants there is feverish activity in making changes so as to use coal instead of gas and these changes will result in a considerable increase in the consumption of coal in this district.

We quote the spot market at $4.25@4.50 for steam and $4.75@5 for gas, mine-run, with slack at $4@4.50, per net ton at mine, Pittsburgh district. Contract coal is not quotable at all.

BUFFALO

Firmer state of bituminous market. Cars shorter than ever. Anthracite in better supply.

Bituminous—The situation is not greatly changed, though jobbers find prices a little stronger but not very uniform. The difficulty is that with so many embargoes and the disposition of consumers to buy as little as possible it is hard to establish a price. Then there is the practice of making prices as high as the consumer will stand, which is not conducive to uniformity.

The car shortage increases and there are embargoes on all sides. The Grand Trunk Railway is most complained of now, but all roads are short of motive power as well as of cars. Mines go days at a time without cars and contracts are unfilled. All factories are running as carefully as they can, lest their fuel supply gives out.

Basing prices on a maximum of $4.50 at the mines for Pittsburgh three-quarter, the f.o.b. Buffalo net-ton price is as follows:

Youghiogheny Gas	$5.50@6.00
Pittsburgh Steam	5.25@5.75
Ohio No. 8	5.25@5.75
Allegheny Valley	5.00@5.50
Pennsylvania Smokeless	5.15@5.65
All Slack	5.00@5.50

There is but little difference as to size. Buyers are not eager and when they must have coal they take anything offering, if they can use it. They all believe lower prices are coming.

Anthracite—The weather is so mild that the clamor for coal has subsided and shippers hope that before cold weather returns they can so far meet the actual demand that there will be an easier market. That the conditions are less strenuous is shown by the decline in the premium on independent anthracite to $3 or less.

The Lake trade is practically closed and soon the coal used in that direction will be turned into the local market. City retailers say that they have sold as much coal this fall as they usually do and the supply is increasing.

Lake shipments of anthracite for the week were 83,400 net tons, of which 26,600 cleared for Chicago, 7,300 for Milwaukee, 37,700 tons for Duluth and Superior and 11,800 tons for Fort William.

Shipments for November were 399,844 tons and for the season to December, 2,699,840 tons, as against 3,757,146 tons to the same date last season. The considerable amount shipped this season by one Buffalo agency from Erie, Penn., while docks here were rebuilding, will increase the actual total materially. Most of the shippers will continue to ship in December as far as possible.

DETROIT

Demand for steam coal continues strong with supply limited. Moderating temperature eases inquiry for domestic grades. Coal for Lake shipment is more plentiful.

Bituminous—Users of steam coal are still finding sufficient for their needs, though there is seemingly no increase in the volume of shipments arriving in the local market. Practically no differential exists between the various sizes and qualities. Mine quotations are holding close around $5 for nut, pea and slack, mine-run and three-quarter lump. In the last two months the Detroit Edison Co. has run behind on receipts about 65,000 tons and its daily supply has dwindled from a normal of 50 cars a day sometimes as low as three cars. The company is in no pressing need of coal.

Moderating weather conditions have brought a slight relaxation in pressure of demand for domestic coal. Stocks in most of the yards are low and additional supplies difficult to get. The mine quotation on lump is given as $5.50 and on smokeless lump and egg $5.75.

Anthracite—There is no improvement in the movement of anthracite, either in dispatch or in volume of shipments. Many of the retail dealers are reported to have little anthracite on hand. Stove and chestnut are less plentiful than egg. Dealers in some sections of the city are getting $11 from domestic consumers for chestnut and $10.25 for stove coal.

Lake Trade—With probably not more than 10 days or two weeks before Lake navigation closes,

a somewhat heavier movement of coal from mines to loading docks is reported. Shippers have been displaying considerable eagerness to get boats and during the week a number of cargoes for ports at the head of Lake Superior were loaded at a rate of 50c. On cargoes for Milwaukee the carrying charge has been from 60 to 75c. Even at that rate vessel owners are not eager for the business as there is a strong demand for boats in the iron ore trade at $1 free from the head of the Lakes. No definite progress seems to have been made toward fixing 1917 coal rates.

CLEVELAND

Steam coal prices firm while domestic grades show some decline. Operators making better shipments on contracts. Lake shipments about finished.

The Cleveland market has held up unusually well considering the recent mild weather. This is especially true as regards steam coal, while prices on smokeless and domestic lump have eased off a trifle. The daily receipts have not increased very much, but the car supply has been some better which has enabled the operators to make better shipments on contracts and thereby lessened the demand on the jobbers.

There has been quite a scramble among Lake shippers to clean up all their Lake coal. In order to do this they have been compelled to send vessels to two and three different loading ports. It is reported that several boats will keep running till Dec. 15, providing the weather is favorable.

Last month Lake shipments were lighter than in the same month a year ago when the total movement for the season was comparatively small. Shipments to Duluth in November totaled 176,600 tons of anthracite and 733,000 tons of bituminous, as compared with 206,200 tons of hard coal and 888,778 tons of soft coal in November, 1915. The total shipments to the head of the Lakes this year to Dec. 1 amounted to 8,959,600 tons of both hard and soft coals, as compared with 8,052,111 tons to Dec. 1, 1915. Of the gain this year, 1,171,000 tons was in soft coal while hard coal shows a decline of 263,000 tons.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$4.75	$4.50	$4.50
Cambridge	4.75	4.50	4.50
Middle Dist.	4.50	4.25	4.25
Hocking	4.50	4.25	4.25
Yough'gheyn	No quotations made		
Pittsburgh	No quotations made		
Pocahontas	....	6.25	....
Fairmont	4.50	4.25	4.25

COLUMBUS

Milder weather causes a slight reaction. This was most noticeable in domestic trade. Some weakness in steam grades also. Some operators able to catch up with their orders. Recession expected to be only temporary.

Retail trade is not as active as many dealers believe that prices will go lower and are holding off. Retail stocks are still short and efforts to get dealers to increase supplies are not meeting with success. Considerable anxiety is felt over the prospects of a sudden cold snap. Retail prices have not declined to any extent as dealers believe that present slowing up is only temporary. Pocahontas is in good demand and the Ohio coals are also selling fairly well.

Steam business is more active, as large consumers have taken advantage of the lull to increase stocks. The stress is over now for the time being at least and no plants are without fuel. Railroads are using a large tonnage and confiscation of cargoes continues. One road confiscated 100 cars in the Hocking Valley.

Production is not increasing to any extent. The closing of the Lake trade is expected to release quite a few cars but this relief will only be temporary. One of the worst features is the congestion reported at junction points, which is delaying shipments. Motive power is short. With lower temperatures this congestion will be more serious.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$4.50	$4.75	....
Inch and a quarter	4.50	4.75	$4.00
Three-quarter inch	4.50	4.50	3.75
Nut	4.25	4.25	3.75
Egg	4.25	4.25	....
Mine run	3.75	4.00	3.75
Nut, pea and slack	3.50	3.50	3.75
Coarse slack	3.50	3.50	3.75

CINCINNATI

Mild weather has softened the market somewhat, but steam demand still insistent, with prices high. Coal stopped by the embargo depresses local domestic prices. Some river coal received.

Reflecting accurately the condition of supply and demand, the steam market continues strong and active, while domestic grades are not so firm. Manufacturers are using maximum tonnages, but domestic consumers have been able to economize on account of mild weather, and dealers are still hoping to get their supplies cheaper. Embargoed coal was sold in sufficient quantities a few weeks ago to help out most yards, and shipments of river coal are relied upon to ease the situation when seasonable rains begin.

The better grades of bituminous nut and slack, from eastern Kentucky and West Virginia fields alike, are quoted at $3.50@3.75 a ton, f.o.b. mines, as compared with $1 or thereabouts normally. Mine-run is lower than this, as it is not favored for steam use in this market on account of the general use of automatic stokers. Pocahontas is hardly to be had in any grade, and quotations are purely nominal. The situation generally is very strong, as severe winter weather is bound to come shortly, and when it does the prepared sizes will soar. The car supply has not improved perceptibly as yet.

LOUISVILLE

Spotty market in eastern Kentucky due to changes in car-distribution methods. Small improvement in car supply and severe shortage again looked for.

Although the demand for steam coals is strong as a rule, eastern Kentucky is not finding that it can dispose of the other sizes. In the southern section the consumers have been better supplied since the embargoes, while the North Central markets are slow to buy on the high prices; this applies especially to domestic sizes, the sale of which has been affected by the continued mild weather. A somewhat larger car supply has been provided but eastern Kentucky operators are of the opinion that the lifting of the embargo on the Louisville & Nashville will create another shortage on its lines.

Prices, f.o.b. the mines, long-ton basis, in eastern Kentucky, have ranged from $3.75 to $5.10 for block in the same day, and on the same coal, largely according to the location of the customer. Generally, however, the standards quoted, with operators selling both ways from these levels, are: Block, $4.25; egg, $3.75; mine-run, $3.85; nut and slack, $3.50.

Western Kentucky finds conditions practically without change. The car supply is reported somewhat better. Lump is quoted $2.50@3; mine-run, $2.25@3; nut and slack, $1.50@2; pea and slack, $1.50.

BIRMINGHAM, ALA.

Local market continues good, with no material advance in prices. Car supply increased, but production and movement still considerably restricted.

The demand for all grades continues good, steam coal being quoted at from $3.50 to $4 per ton at the mines. Some contract business is being booked, but due to the present high price levels and the uncertainty of the future both contractors and operators are loath to enter into contracts of one and two years' duration. The Empire Coal Co. closed a contract this week for a large tonnage with the United Fruit Co., shipments to be made to New Orleans. The New Orleans Railway & Light Co. is still holding up its two-year contract for approximately 400,000 tons, although bids were submitted on this business about six weeks ago, and their present contract expires in a few days. The domestic market continues fair, with sufficient business to keep the mines busy well into January.

The railroads are gradually increasing the car supply, but operations are still suffering delay from this cause and are unable to secure the movement of sufficient tonnage to prevent temporary shutdowns at some industrial plants.

Coke

CONNELLSVILLE

Car supplies poor. Consumers not fully supplied. Spot market narrow.

Car supplies in the coke region continue poor and there are few operations that do not lose some production in the course of a week. On many contracts shipments are short and blast furnaces are compelled frequently to bank for a day or two or to run at reduced rate, at the very time that pig-iron prices are advancing more sharply than ever before in the history of the iron industry, at the rate of, say, $2 per ton per week. Possibly the coke situation is responsible in considerable part for the strength of the pig-iron market.

The volume of demand for spot furnace coke is probably no measure of the amount by which consumers are short, as it is patent that no considerable tonnage of coke can be picked up at any price and the spot market is made by the few whose needs are so urgent that they are willing to pay a fancy price now and then. There is practically no interest manifested in contract furnace coke. We quote: Spot furnace, $7.50@8; contract, $4@$4.50; spot foundry, $9@10; contract, $5.50@6.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 25 at 408,169 tons, an increase of 9,870 tons, and shipments at 401,231 tons, an increase of 28,372 tons.

Buffalo—The market is strong, though prices are not so high as they were a month ago. Consumers realize that December is a month of light production on account of the holiday season and besides the car supply was never so light or so uncertain as now. The decline in bituminous prices has turned coke makers back to their ovens, but the lack of cars is likely to continue. Quotations are $9.85 for best Connellsville foundry or furnace and $8.35 for high sulphur or stock.

Chicago—Coke prices are so erratic and uncertain that it is difficult to name index figures. Local shippers are mostly filling contract orders, and what little spot coal is marketed is sold around $9 per ton, irrespective of size. It is reported that unless some of the byproduct ovens get more coal shortly they will have to curtail their output. The extreme heavy demand is due in part to scarcity of other fuel and increased substitution for anthracite. Chestnut is in particularly keen demand. A number of byproduct plants are projected to be built soon at several Western points.

Nominal prices per net ton, f.o.b. cars Chicago, are approximately as follows:

Connellsville	$9.00@10.50
Wise County	9.00@10.50
By-Product Foundry	9.50@11.00
By-Product Domestic	8.50@10.00
Gas House	6.75@ 8.00

Birmingham, Ala.—Furnace coke is so scarce in the district that the Matthew Iron and Mining Co., which has rehabilitated a blast furnace at Rome, Ga., has been forced to seek a supply in the West Virginia fields, and other business offered the local producers had to be declined. The furnaces are being sorely pressed to secure a sufficient tonnage for operations. Foundry coke is much sought after, with quotations at $5.50 to $6 per ton, ovens, and little free tonnage of this grade available.

Middle Western

GENERAL REVIEW

High prices holding firm. Car situation slightly easier. Weather mild. Demand for steam coals in excess of supply.

Shipments from Eastern mines have been somewhat heavier owing to improvement in the car situation. A shortage of coal is still everywhere felt, and should colder weather ensue it is difficult to prophesy what would happen.

Movement on the railroads is perceptibly improved, and it is announced that cars which have heretofore been used in the movement of iron ore approximating some 15,000, will at the close of navigation be turned over to Western carriers for coal traffic. The Illinois Public Utilities Commission has issued an order requiring the prompt return of equipment to owning carriers, similar to that recently issued by the Interstate Commerce Commission. The Illinois carriers have been asked by the Illinois commission to agree upon some regulations governing the practice of reconsignment, the commission being desirous of entering an early order on this proposition.

All signs point to a heavy demand for long haul all-rail movement of coal upon the close of navigation. Steam users are sharply bidding for tonnage to keep their plants from shutting down, which causes free screenings to maintain their high level of $3.50 to $4 per ton. Even with the increased shipments from the East there is little more free coal now than six weeks ago. The Northwest is badly feeling the necessity for additional coal, and is placing heavy orders with Western mines.

At most Illinois and Indiana mines orders are nearly 100 per cent. in excess of production, which shows that operators are far from making any progress in catching up with orders. Shippers report that Western carriers are making strong efforts to obey the Home Routing Instructions of the Interstate Commerce Commission, even sending many cars out of loading districts empty.

CHICAGO

Supply of Western coals diminished while offerings of Eastern grades are better. All prices maintained at a high level.

Operating time in the southern Illinois fields is averaging from 35 to 65 per cent, the Harrisburg field being the worst sufferers from lack of cars and the Franklin County mines being better served with empties than any of the other districts. Expansion of territory served by southern Illinois coals is quite noticeable, and shipments are being made at high prices to points never sold before. Saline County operators have had very little free coal to offer this week and shipments have been mostly on contracts. A good many shippers are charging old customers from 50c to $1 under the prices quoted to new trade. Lump is ranging from $3.75 to $4.25, with screenings selling readily at $3.75.

Car supply at the central Illinois mines has averaged about 60 per cent. Domestic sizes are selling at from $3.50 to $4, with screenings and other steam sizes averaging $3.50. Fulton and Peoria County domestic demand is very strong, prices ranging from $3.50 to $4 for lump, and $3 to $3.50 for screenings.

The car situation at Indiana mines has not improved. About enough cars are supplied to enable the operators to run three days per week, and a great many of them can only about meet contract obligations. Knox County shippers have been busy on steam contracts, and Clinton opera-

tors have been shipping domestic sizes heavily to Chicago during the past week. Some of the Sullivan County operations are now offering free domestic lump at maximum market prices.

Receipts of free smokeless sizes have increased, and contract shipments are coming forward in about the same ratio as heretofore. Free tonnage has been absorbed as rapidly as received. Splint has been easier because of the reported forwarding of a considerable tonnage. Hocking has averaged about $4 to $4.25 per ton, with little tonnage in evidence.

Anthracite coal is scarcer and scarcer. The larger dealers are depleting their storage piles and seem unable to obtain additional tonnage. While shipments during the last week have been heavy, they have not equalized the lack of receipts early in the year. Premiums as high as $3 per ton over circular have been offered without materially affecting the situation.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump	$3.50@4.00	$3.50@4.00	$3.50@4.00	$3.50@3.75	$4.25@5.00
Steam lump	3.50@3.75	3.25@3.50	3.50@3.75	.....	.....
Egg	3.50@3.75	3.25@3.75	3.50@3.75	3.50@3.75	4.00@4.75
Nut	3.50@3.75	3.25@3.75	3.25@3.75	.....	.....
Mine-run	3.25@3.50	3.25@3.50	3.25@3.50	3.25@3.50	4.00@4.25
Screenings	3.25@3.50	3.00@3.50	3.25@3.50	3.25@3.50	3.75@4.25

	Wlmson. & Frankln. Cos.	Saline & Harris-burg	Poca. & W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump	$3.50@4.00	$3.75@4.00	$5.00@6.00	$5.00@6.00	$4.50@5.00
Egg	3.50@4.00	3.75@4.00	5.00@6.00	5.00@6.00	4.50@4.75
Nut	.....	3.50@3.75	3.00@4.75	.....	3.75@4.75
No. 1 nut	3.50@4.00	.....	.....	.....	.....
No. 2 nut	3.50@3.75	.....	.....	.....	.....
No. 3 nut	3.25@3.50	.....	.....	.....	.....
No. 1 washed	3.75@4.00	.....	.....	.....	.....
No. 2 washed	3.50@3.75	.....	.....	.....	.....
Mine-run	3.50@4.00	3.50@3.75	4.25@4.50	4.00@4.50	3.25@4.00
Screenings	3.50@3.75	3.50@3.75	.....	.....	.....

Hocking Lump $4.00@4.25. Splint Lump $4.00@4.25.

ST. LOUIS

An easier market prevails on everything. Warmer weather has eased up the domestic demand. Steam buyers anticipate a falling market. Car supply greatly improved. Country buying slow, and indications point to a general decline.

Warm weather in the St. Louis territory has eased up the demand on both steam and domestic, especially the latter. In the city proper there is very little domestic business and then it is on Standard coal only. The buying from the country is straggling and with a tendency to delay as long as possible in the hope that the slump which comes just before the holiday season will bring lower prices. There is good reason for expecting this slump; as a matter of fact it is already in motion, and unless we have some unusually cold weather in the immediate future, a sharp decline is in sight.

In the past day or two operators in the Illinois field have had coal to ship and no orders to fill. Under ordinary conditions of the past few months this would not have happened, but there is an abnormal car supply at present. Mines in the Illinois field are now working five days a week in some sections, and throwing their tonnage in on the open market for about three of these days.

Car supply has shown a wonderful improvement on all roads excepting the M. & O. One thing that has helped the market this week is the fact that the railroads have drawn heavily for railroad fuel, in anticipation of colder weather the latter part of the month. This has kept the market in a firmer shape than if this coal were to have been shipped commercially.

The top of the market in the country is $4 now, and in St. Louis it has dropped off fully 25c. to 50c. on domestic sizes. Screenings are not as strong as might be expected. No smokeless moved in this week as far as is known. A few cars of anthracite came through, and a car or two of Arkansas semi-anthracite.

The St. Louis market, short ton f.o.b. mines, is:

	Williamson & Franklin Co.	Mt. Olive[1]	Staunton[2]	Standard
6-in. lump	$3.25@3.75	$3.25	$3.25	$3.25
3x6-in. egg	3.25@3.75	3.25	3.25	3.25
2x3-in. nut	3.25@3.75	.....	.....	3.00
No. 2 nut	3.25@3.75	.....	.....	3.00
No. 3 nut	3.00	.....	.....	.....
No. 4 nut	3.00	.....	.....	.....
No. 5 nut	2.75	.....	.....	.....
2-in. screen	2.75@3.00	2.75	2.75	2.75@3.00
2-in. lump	.....	.....	.....	3.00
3-in. lump	.....	3.25	3.25	.....
Steamegg	.....	3.00	3.00	3.00
Minerun	3.00@3.25	3.00	2.75	2.75@3.00
Washed				
No. 1	3.25@3.75	.....	.....	.....
No. 2	3.25@3.75	.....	.....	.....
No. 3	3.00	.....	.....	.....
No. 4	3.00	.....	.....	.....
No. 5	2.75	.....	.....	.....

[1] Regular trade 6-in. lp. @ $1.85; 3-in. @ $1.75.
[2] Regular trade 6-in. lp @ $2.

In the local market delivered prices to consumers are:

Standard lump and egg	$4.00
Mt. Olive lump and egg	4.25
Wm. & Franklin Co. lp. and egg	4.50 to 4.75

Shipments to the country are about 50c. higher than the St. Louis local market on nearly all sizes.

KANSAS CITY

The domestic coal market has been helped by warm weather, which has held off the insistent winter demand. Supplies, however, have accumulated very slowly. Much cheap coal has been put on the market, and many mines have been opened that under normal conditions would only be operated during winter weather. While many steam users are nervous, and are making insistent calls for coal, there has yet been no actual distress.

SPOKANE, WASH.

Coal prices here have advanced more than a dollar a ton in the last month, and many smaller towns in the surrounding district are suffering for supplies. Coal that ordinarily sells for $7.50 to $8 is now selling from $9 to $10 a ton, and the sales are necessarily limited to imperative needs. Wood as a substitute for coal is also experiencing a shortage and increased prices. Wood that ordinarily sells at from $4.50 to $5 per cord is now on the market in limited quantities at $8.50 per cord.

Telephone messages to 25 towns surrounding Spokane show that the same conditions exist in all parts of this territory.

General Statistics

NORFOLK & WESTERN

Distribution of shipments for September of this year were as follows:

	Shipped	Tipple	Total
Pocahontas	1,482,309	11,072	1,493,381
Tug River	317,068	2,524	319,592
Thacker	295,628	7,434	303,062
Kenova	84,392	6,716	91,108
Totals	2,179,397	27,746	2,207,143

Shipments of coke, entirely from the Pocahontas field amounted to 110,465.

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled by 17 principal Middle Western carriers for the month of August, and the first eight months of 1915 and 1916.

	August		8 Months	
	1915	1916	1915	1916
Illinois Central	637,650	914,105	4,633,790	5,968,223
C. & E. I. R.R.	498,832	551,697	3,750,610	4,632,970
C. B. & Q. R.R.	492,260	679,338	3,319,302	4,104,645
C. C. C. & St. L. R.R.	412,072	388,313	3,151,329	3,399,810
Vandalia R.R.	357,496	327,870	3,072,845	3,310,542
C. T. H. & S. E. Ry.	226,343	335,476	1,934,189	2,412,745
C. & A. Ry.	158,676	181,893	1,202,486	1,572,416
Wabash R.R.	119,741	126,610	989,121	1,023,379
St. L. I. M. & S. Ry.	142,646	161,533	976,729	1,167,988
Southern Ry.	88,521	144,246	605,290	1,214,793
B. O. S. & W. R.R.	75,535	66,612	623,531	485,359
St. L. T. & E. R.R.	49,696	97,462	380,663	528,373
St. L. & O. F. Ry.	50,829	65,833	400,542	462,095
L. & M. Ry.	34,445	50,331	299,800	344,232
C. I. & L. Ry.	57,465	80,070	426,077	504,257
C. P. & St. L. Ry.	27,967	35,972	260,074	315,944
C. & N. W. Ry.	30,675	39,435	262,904	334,429

BALTIMORE & OHIO R.R.

The following coal and coke tonnage was moved over the Baltimore & Ohio R.R. and affiliated lines during the months of September and October, 1916 and 1915:

	September		October	
	1916	1915	1916	1915
Coal	2,895,719	3,034,271	2,812,756	3,124,328
Coke	352,629	331,224	371,537	368,257
Total	3,248,348	3,365,495	3,184,293	3,492,585

Foreign Markets

GREAT BRITAIN

Nov. 23—The Welsh coal market continues to be exceedingly quiet. Some of the collieries, indeed, experience great difficulty in keeping going. Undernoted are the normal prices, but buyers of prompt coal can get on at considerable reductions on same.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$6.96@7.20
Best dry coals	6.48@6.72
Best Monmouthshires	6.60@6.84
Seconds	6.24@6.48
Best Cardiff smalls	4.56@4.80
Cargo smalls	4.20@4.32

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Again we have to report a small volume of chartering, tonnage being exceedingly scarce; however, rates in certain directions are advancing considerably.

The market is quotable as follows:

Gibraltar	$13.20	Port Said	$15.60
Marseilles	14.04	Las Palmas	9.00
Genoa	14.28	St. Vincent	9.60
Naples	13.80	River Plate	10.80
Alexandria	16.20		

BRITISH EXPORTS

Exports—British exports for October and the 10 months of the past two pears were as follows:

To	October 1915	October 1916	Ten Months 1915	Ten Months 1916
Russia	2,890	.....	41,558	4,804
Sweden	183,147	124,153	2,274,194	1,369,871
Norway	195,514	201,275	2,292,189	1,994,491
Denmark	218,143	169,055	2,741,093	1,953,231
Nethrl	171,094	140,198	1,500,333	1,085,234
France	1,602,306	1,628,240	14,827,062	14,916,886
Portugal[1]	84,069	73,758	871,491	743,864
Spain[4]	132,192	176,366	1,295,609	1,558,770
Canary	35,731	22,161	423,944	367,875
Italy	559,534	578,057	4,962,532	4,976,114
Greece	16,864	20,236	296,918	149,728
Turkey	.....	.....	10,324	3,219
Algeria	66,889	63,767	793,215	632,682
Portugal[5]	6,114	14,144	156,536	190,638
Chile	385	2,061	39,040	23,566
Brazil	22,274	12,178	446,556	184,844
Uruguay	18,173	8,727	270,531	166,325
Argentina	36,553	19,192	1,325,993	650,071
Channel Is	8,924	8,490	109,384	106,774
Gibraltar	26,744	67,535	296,528	436,480
Malta	12,806	14,971	127,300	63,622
Egypt[3]	74,353	87,356	1,154,788	682,745
Aden[3]	1,476	6,048	112,365	15,691
India	715	918	23,800	10,058
Ceylon	.....	.....	38,730	25,726
Miscell	53,656	58,895	512,745	427,849
Coke	113,499	113,901	798,188	1,263,596
Briquettes	127,024	96,618	1,087,660	1,146,418
Total	3,771,069	3,708,300	38,830,606	35,151,172
Bunker	1,022,578	1,140,078	11,745,472	10,960,984

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

I. C. C. Decisions

No. 5734. Huerfano Coal Co. et al. vs. Colorado & Southeastern Railroad Co. et al. Submitted Aug. 6, 1915. Decided Nov. 9, 1916.

Former finding that trackage contract between the Colorado & Southeastern Railroad and the Colorado & Southern Ry. causes an unlawful discrimination against complainants in the matter of car supply, affirmed on rehearing.